

ANIMAL KEEPERS' FORUM



NOVEMBER 2009
**The Journal of the American
Association of Zoo Keepers, Inc.**

AKF Managing Editor: Susan D. Chan • **Associate Editors:** Becky Richendollar, North Carolina Zoo • Mark de Denus, Winnipeg, MB • **Enrichment Options Column Coordinator:** Julie Hartell-DeNardo, Oakland Zoo and Ric Kotarsky, Tulsa Zoo & Living Museum • **Legislative/Conservation Outlook Column Co-Coordinators:** Becky Richendollar, North Carolina Zoo and Greg McKinney, Philadelphia, PA • **Reactions Column Coordinator:** William K. Baker, Jr., Abilene Zoo, Abilene, TX • **ATC Column Co-Cordinators:** Angela Binney, Disney's Animal Kingdom; Kim Kezer, Zoo New England; Jay Pratte, Zoo Atlanta • **Conservation Station Co-Coordinators:** Penny Jolly, Greater Orlando AAZK Chapter and Amanda Kamradt, New England AAZK Chapter • **Proofreader:** Barbara Manspeaker, AAZK Administrative Office.

Animal Keepers' Forum is published monthly by the American Association of Zoo Keepers, Inc., 3601 S.W. 29th Street, Suite 133, Topeka, KS 66614-2054. Ten dollars of each membership fee goes toward the annual publication costs of Animal Keepers' Forum. Postage paid at Topeka, KS.

AAZK Executive Director: Ed Hansen, AAZK, Inc., Topeka KS

also serves as **AAZK Liaison to the Association of Zoos & Aquariums (AZA)**

AAZK Administrative Secretary: Barbara Manspeaker, AAZK, Inc., Topeka, KS

BOARD OF DIRECTORS

Shane Good, Cleveland Metroparks Zoo, Cleveland, OH 44109

President

Bob Cisneros, San Diego Zoo, San Diego, CA 92112-0551

Vice President

Tammy Root, Indianapolis Zoo, Indianapolis, IN 46222

Gisela Wiggins, North Carolina Zoo, Asheboro, NC 27205-1425

Penny Jolly, Disney's Animal Kingdom, Lake Buena Vista, FL 32830-1000

COMMITTEES/COORDINATORS/PROJECT MANAGERS

By-laws

Chair - Gisela A. Wiggins, North Carolina Zoo

Ethics

Chair - Bob Cisneros, San Diego Zoo

Grants Committee

Awards

Chair - Shelly Roach, Columbus Zoo

Chair - Janet McCoy, The Oregon Zoo

Behavioral Husbandry Committee

Annual Conferences

Chair - Deana Walz, The Living Planet Aquarium

Coordinator - Ed Hansen, AAZK, Inc.

Professional Development

Conservation Committee

Melaina Wallace, Disney's Animal Kingdom

Amanda Kamradt, New England AAZK Chapter

ICZ Coordinators

Bowling for Rhinos

Shane Good, Cleveland Metroparks Zoo

Coordinator - Patty Pearthree, Cary, NC

and Norah Farnham, Woodland Park Zoo

Products and Membership

Media/Website

Jacque Blessington, K. C. Zoo, Project Manager

Denise Wagner, The Phoenix Zoo, Project Manager

MEMBERSHIP SERVICES

Data Transfer Forms

Available for download at www.aazk.org

AAZK Publications/Logo Products

Available through the AAZK website or from The AAZK Administrative Offices/Topeka

Table of Contents

About the Cover/Information for Contributors.....	450
Scoops & Scuttlebutt.....	451 - 454
From the Executive Director.....	456
In Memorium ~ Gerald "Red" Thomas.....	457
AAZK, Inc. Thanks Its Chapters for Their Support.....	458 - 459
Coming Events.....	460 - 461
Call For Papers for Avian Husbandry Issue.....	461
Training Tales (Seeking Submissions).....	462
AAZK Announces New Members.....	463
Letters to the Editor.....	464 - 465
Crisis Management CD Now Available.....	466
Enrichment Options (<i>Humboldt Penguin Enrichment</i>).....	467 - 469
Professional Development Grant Report/Info on AAZK Grants Available.....	470
Assessing Immediate and Long-Term Effects of Environmental Enrichment:	
Implications for Welfare of African Clawless Otters (<i>Aonyx capensis</i>).....	471 - 476
Care and Management of Geriatric Animals in Zoos (order info).....	477
Book Reviews (<i>Bats in Captivity, Vol. 1 - Biological and Medical Aspects; Handbook of Venoms and Toxins in Reptiles</i> ; and <i>Hey, Mister -- Your Alligator's Loose</i>).....	
478 - 479	
ZOOTUBE on Display in 10 U.S. Zoos.....	480
Behavior-based Bear Husbandry for Winter Denning:	
A practical application at Fortress of the Bear, Sitka, Alaska.....	482 - 486
Conservation/Legislative Update.....	487 - 492



35th Anniversary - 1974 - 2009

MISSION STATEMENT

(Revised April 2009)

American Association of Zoo Keepers, Inc.

The mission of the American Association of Zoo Keepers, Inc. is to advance excellence in the animal keeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.

This month's cover features a drawing of Harris' antelope ground squirrels (*Ammospermophilus harrisi*) drawn by Marie Vester, a Docent and Research Volunteer at the Los Angeles Zoo and Botanical Gardens, Los Angeles, CA. This species is quite small, weighing only about one-quarter of a pound with a body length of about six inches. Their coats are grayish with a white stripe down each side. A white ring encircles each eye, giving the Harris' antelope squirrel a spectacled appearance. They hold their three-inch long tails over their backs to provide shade in the dry deserts and rocky hills of the southwestern U.S. and northwestern Mexico areas where they live. They are diurnal and active during even the hottest part of the day, sheltering in burrows at night. They have a higher body temperature (97-107°F/~36-42°C) than any other non-sweating mammal and cool themselves by salivating. They practice "heat-dumping," lying on their bellies in the shade with their legs sprawled out to rid their bodies of excess heat. Their diet depends on where they live; cactus fruit and seeds, mesquite beans, and yucca seeds. They store some food in their underground burrows. Although mating can take place from December or January until June, peak reproductive activity occurs from February-March. Gestation lasts for about 30 days, and the litter size may range from 5-14. The average litter size is 6.5. Females give birth to only one litter per year. Newborns are naked and the skin is pink and somewhat transparent. In some parts of its range, the Harris' antelope squirrel is losing habitat to agriculture and other human developments. It is considered threatened in the state of California. The Los Angeles Zoo exhibits four of these ground squirrels and patrons enjoy watching them bounce around the exhibit like they've been shot from tiny cannons. Thanks, Marie!

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or email contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone 785-273-9149; FAX (785) 273-1980; email is akfeditor@zk.kscoxmail.com<. If you have questions about submission guidelines, please contact the Editor.

**Deadline for each regular issue is the 10th of the preceding month.
Dedicated issues may have separate deadline dates and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. If an article is shown to be separately copyrighted by the author(s), then permission must be sought from the author(s). Reprints of material appearing in this journal may be ordered from the editor. Regular back issues are available for \$4.00 each. Special issues may cost more.

E-Mail Addresses:

You may reach Barbara Manspeaker at AAZK Administrative Offices at: aazkoffice@zk.kscoxmail.com<

You may reach Susan Chan and *Animal Keepers' Forum* at: akfeditor@zk.kscoxmail.com<

Mailing Address:

AAZK, Inc., 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054

**AAZK website address: www.aazk.org
BFR Website: <http://aazkbfr.org>**

Scoops & Scuttlebutt

Combined AAZK/ICZ Conference Quite a Gathering

The combined conference for the American Association of Zoo Keepers and the International Congress on Zookeeping, held in September in Seattle, WA, was an amazing gathering of zoo professionals from near and far. A total of 406 delegates came together for nearly a week of paper sessions, workshops, zoo visits and a chance to interact with colleagues representing 25 countries besides the U.S. These included delegates from the following countries: Australia, Austria, Bahamas, Cameroon, Canada, Columbia, Denmark, France, Gabon, Germany, India, Indonesia, Ireland, Japan, Kenya, The Netherlands, New Zealand, The Phillipines, Singapore, South Africa, Spain, Sweden, Uganda, United Arab Emirates, and the United Kingdom. The Puget Sound Chapter of AAZK and the Woodland Park Zoo are to be congratulated on hosting a stimulating and very "green" conference. AAZK appreciates all of the hard work by Chapter members, as well as other zoo staff and volunteers, ICZ members and many others for their extraordinary efforts in putting on this unique joint conference.



Seeking Bird Photos

We are currently planning on producing an issue of *AKF* dedicated to Avian Husbandry in April of 2010. We would like to feature a four-color photo cover for this issue. Therefore, we are soliciting you photographers out there to submit your best and most colorful bird photos to the editorial staff for their consideration. There is a Call for Papers for this issue elsewhere in this issue of *AKF* that has a submission deadline of January 5, 2010. For your photo to be considered for the cover of this dedicated issue, it needs to be to the *AKF* staff **by February 1, 2010**. Photos should be high resolution (300 dpi) and may be sent as jpg or tif files attached to the editor's email address (akfeditor@zk.kscoxmail.com) Those submitting should also include their name, full mailing address, email address and daytime or cell phone number. Photographers should also include both the common and scientific name of the species featured and a paragraph or two about its natural history. If you have questions about making a submission, please contact Susan Chan at the email address above or call 785-273-9149.

Rolling With "Bowling For Rhinos" (BFR) - from BFR Coordinator Patty Pearnthree

We had an excellent meeting at the AAZK/ICZ conference in Seattle. All three organizations supported by "Bowling For Rhinos" funds met with the Board and the BFR coordinator to come together to "grow" the BFR program. These organizations are "Lewa Wildlife Conservancy" (LWC), "International Rhino Foundation"(IRF) and "Action for Cheetahs"(ACK)-formerly called "Cheetah Conservation Fund-Kenya".



Our #1 BFR goal for 2010 is to have all 85 AAZK Chapters participate in "Bowling For Rhinos". Don't panic. If bowling is not the thing to do in your area, any type of fundraiser is welcome. Some chapters have been very successful with "Wii bowling", "Run/Race for Rhinos", "Rummage for Rhinos", "Rock n' for Rhinos", "Sailing for Rhinos"...and the list goes on. All donations, of course are always welcome and count as participation. Remember, it takes about five consecutive years for a fundraising event to catch on in your community so it is important to keep rolling with BFR in order to be successful.

Our #2 BFR Goal is to raise \$400,000 in 2010. If we increase the overall size of the "conservation pie" each of the organizations we support will receive a larger amount of money. It will be tough in this economy but all three organizations are also feeling the effect of the economy and are in need of extra support more than ever. During tough times, poaching pressure increases and the cost of protecting wildlife increases.

If your Chapter has not yet turned in funds from the 2009 event, it is not too late. Please do so ASAP. We raised \$273,000 in 2008 and it looks like 2009 will be less than \$250,000. If your Chapter is able to make a “year-end donation” toward the 2009 BFR event, **please send funds by December 1st** to: Patty Pearthree, c/o BFR, 318 Montibello Dr., Cary, NC 27513

Checks payable to: “AAZK, Inc-BFR”

Indianapolis Prize Winning Conservationist Fights for Snow Leopards’ Survival

As Vice President of Panthera and Senior Conservationist for the Wildlife Conservation Society <<http://www.wcs.org/saving-wild-places.aspx>>, George B. Schaller, Ph.D., is relentless in his pursuit to save endangered species across the globe. The winner of the second Indianapolis Prize credits the award with helping him reach some important milestones in his work to save snow leopards in 2009.



Generous with his time and resources, Schaller used a portion of the \$100,000 Indianapolis Prize to visit China’s Qinghai Province in May 2009 to help initiate snow leopard programs supported by Panthera, an organization whose mission is to conserve the world’s 36 species of wild cats. Most of Schaller’s work was conducted in the Sanjiangyuan Reserve (“Source of Three Rivers Reserve”—Yellow, Yangtze, Mekong), which covers nearly 58,000 square miles, primarily at elevations above 11,800 feet. In addition to assessing snow leopard presence and threats, the trip provided Peking University Ph.D. student Li Juan with the training she needs to start a snow leopard study this year. Schaller and Juan traveled more than 2,600 miles to evaluate potential study areas for the student’s research project, and Schaller will continue to mentor Juan as she pursues her Ph.D.

While in Asia, Schaller met with representatives from the Snow Leopard Trust and Shan Shui, one of the leading conservation organizations in China, to create a new collaborative snow leopard research and conservation program. These organizations signed a long-term agreement that will bring much needed expertise and funding to efforts to save snow leopards in China, where as much as 50 percent of the remaining wild population exists.

“George Schaller’s extensive research, fieldwork and training have been essential to saving snow leopards in regions of China,” said Tom McCarthy, Director of Snow Leopard Programs for Panthera. “I can’t think of a better use of the Indianapolis Prize funds than teaching future generations the urgency and necessity of wildlife conservation.”

“The important aspects of this project for me,” added Michael Crowther, president and CEO of the Indianapolis Zoo, “are its collaborative and long-term nature. It’s George’s innate ability to bring people together and to forge alliances that overcome the short-term problems of political or geographic conflicts in order to serve the greater good that makes him a hero for me, and for the world. It seems he has again worked his magic for the snow leopards.”

Nominees Announced for the 2010 Indianapolis Prize

Leading animal conservationists vie for \$100,000 award

Twenty-nine animal conservationists who have dedicated their lives to saving the Earth’s endangered species have been nominated to receive the biennial Indianapolis Prize, the world’s leading award for animal conservation. The nominees’ work spans the globe, representing a range of species from insects to mammals, and includes amphibians, elephants, bats, wolves and sharks, among many others. The Nominating Committee will review the applications and select the six finalists, who will be announced in the spring of 2010. The Prize Jury will then determine the winner who will be announced in mid-2010 and honored at the next Indianapolis Prize Gala, to be held September 25, 2010 in Indianapolis.

In addition to receiving the \$100,000 Prize, the recipient is also awarded the Lilly Medal, an original work of art that signifies the winner's contributions to conserving some of the world's most threatened animals. The 2008 Indianapolis Prize was awarded to legendary field biologist George Schaller, Ph.D. Schaller's accomplishments span decades and continents, bringing fresh focus to the plight of several endangered species – from tigers in India to gorillas in Rwanda – and inspiring others to join the crusade.

"Following in Schaller's footsteps will not be easy, but the current nominees are exceptional," said Michael Crowther, president and CEO of the Indianapolis Zoo, the organization responsible for initiating the conservation award. "These conservationists are all living their own unique and fascinating adventures that battle the odds, but achieve great victories."

In alphabetical order, the nominees for the 2010 Indianapolis Prize are:

- **Gerardo Ceballos, Ph.D.:** (Instituto de Ecología, Universidad Nacional Autónoma de México) Leader in designing conservation strategies for endangered species and threatened ecosystems; conducted the first geographically explicit analysis of patterns of population and species extinction in a major taxonomic group (mammals).
- **Nigel Collar, Ph.D.:** (BirdLife International) Researched and compiled a unique and comprehensive dataset on globally threatened bird species that was published in groundbreaking regional Red Data Books worldwide.
- **Iain Douglas-Hamilton, Ph.D.:** (Save the Elephants) Founded Save the Elephants; devotes his life to the cause of elephant conservation – from testifying before Congress to leading anti-poaching aid programs in Africa.
- **Karen Eckert, Ph.D.:** (WIDECAST: Wider Caribbean Sea Turtle Conservation Network) Dedicated to research, multilateral marine resource management and the international conservation policies for sea turtles for more than three decades.
- **Ruth M. Elsey, M.D.:** (Louisiana Department of Wildlife and Fisheries) Fostered programs to enhance the survivability and sustainability of the American alligator, in addition to parallel efforts for other crocodilians.
- **George Fenwick, Ph.D.:** (American Bird Conservancy) Founded American Bird Conservancy; dedicated to creating and sustaining globally significant biodiversity reserves, tackling policy-based threats to birds and generating funding resources for the biodiversity community.
- **Rodney Fox:** (Rodney Fox Shark Expeditions/Fox Shark Research Foundation) Miracle survivor of one of the world's worst shark attacks; regarded as a world authority on Great White Shark research, observation and conservation.
- **Birute Mary Galdikas, Ph.D.:** (Orangutan Foundation International) More than 35 years of advancing research on wild orangutan ecology and behavior; established rehabilitation and release programs and saved millions of acres of tropical rain forest in Kalimantan.
- **Paul Garber, Ph.D.:** (University of Illinois Urbana-Champaign) More than 30 years of dedication and commitment to research, conservation and educational programs involving the monkeys of Latin America.
- **Jack Hanna:** (Columbus Zoo and Aquarium) For more than 30 years, Hanna has been the public face of zoos, bringing the conservation message to millions of people worldwide; passionately dedicated to Rwanda's endangered animals and its people.
- **Maurice Horrocker, Ph.D.:** (Selway Institute; Professor Emeritus, University of Idaho) Devoted his career to understanding the ecological role of wild cats and advocating for the conservation of large carnivores, including the first-ever field investigation of cougars.
- **Rick Hudson:** (Fort Worth Zoo; International Iguana Foundation; IUCN Turtle Survival Alliance) Dedicated advocate for reptile conservation, including groundbreaking work with the Jamaican iguana and the coordination of the largest turtle rescue event in history.
- **Lisa Hywood:** (Tikki Hywood Trust) Works tirelessly to preserve Zimbabwe's wildlife – including captive breeding, management and monitored release of endangered species and conservation education in under-privileged, rural areas.
- **Rodney Jackson, Ph.D.:** (Snow Leopard Conservancy) Conducted an in-depth radio-tracking study of snow leopards in the 1980s; dedicated to building local communities' capacity as key players in conserving the species.
- **Jana Johnson, M.S., Ph.D.:** (Moorpark College, The Butterfly Project) Founded The Butterfly Project, a center for endangered butterfly propagation and research; helped the Palos Verdes blue butterfly population, once presumed extinct, grow from 200 to 10,000.
- **James Earl Kennamer, Ph.D.:** (National Wild Turkey Federation) Devoted leader in wild turkey research, scientific wildlife management and forging cooperative conservation partnerships to grow the wild turkey population from 1.3 million to 7 million in less than 30 years.

- **Thomas H. Kunz, Ph.D.:** (Boston University) For more than 50 years, has significantly and instrumentally contributed to the conservation and teaching of bat ecology, physiology and behavior.
- **Amanda Lollar:** (Bat World Sanctuary) Established Bat World Sanctuary, the largest rehabilitation facility in the world dedicated exclusively to bats; created the first nutritionally sound diet for debilitated bats.
- **Edward Louis Jr., Ph.D., DVM:** (Omaha's Henry Doorly Zoo) Tireless conservation advocate of island biogeography, including the discovery of 30 percent of known lemurs to date.
- **Laurie Marker, D.Phil.:** (Cheetah Conservation Fund) Founded the Cheetah Conservation Fund; led a conservation program from humble beginnings in rural Namibia to an unparalleled model for predator conservation.
- **Stephen McCulloch:** (Harbor Branch Oceanographic Institution) Created legislation to fund several ongoing marine mammal research and conservation programs while working to construct the first teaching marine mammal hospital, science and education center.
- **Rodrigo Medellin, Ph.D.:** (University of Mexico) Galvanized bat research throughout Latin America by using a multipronged approach including research, education, population biology, molecular ecology and community involvement.
- **Gregory Rasmussen, Ph.D.:** (Painted Dog Conservation) Diligent advocate of the critically endangered African wild dogs; founder of the Painted Dog Conservation, which strives to increase the range and numbers of wild dogs in Zimbabwe and elsewhere in Africa.
- **Patrick T. Redig, DVM, Ph.D.:** (The Raptor Center, College of Veterinary Medicine, University of Minnesota) Dedicated more than 35 years to protecting raptor populations through extensive field work, bench research, clinical work, professional teaching and community service.
- **Lente Lidia Roode:** (Hoedspruit Endangered Species Centre) Established the Hoedspruit Endangered Species Centre, a nonprofit organization that provides a safe haven for orphaned and sick animals, complete with an education center, rescue unit and breeding program.
- **Patrick Rose:** (Save the Manatee Club) Worked to help educate opponents, build coalitions and focus on specific protection goals for manatees, including protecting the manatee's habitat and advocating for strong growth management laws.
- **Carl Safina, Ph.D.:** (Blue Ocean Institute) Brought ocean conservation into the environmental mainstream by using science, art and literature to inspire "sea ethic."
- **Simon Stuart, Ph.D.:** (IUCN-World Conservation Union) Developed the IUCN Red List Categories and Criteria, which assesses the extinction risk for species.
- **Amanda Vincent, Ph.D.:** (The University of British Columbia) First person to study seahorses underwater, document extensive commercial trade, and initiate a seahorse conservation project, Project Seahorse.

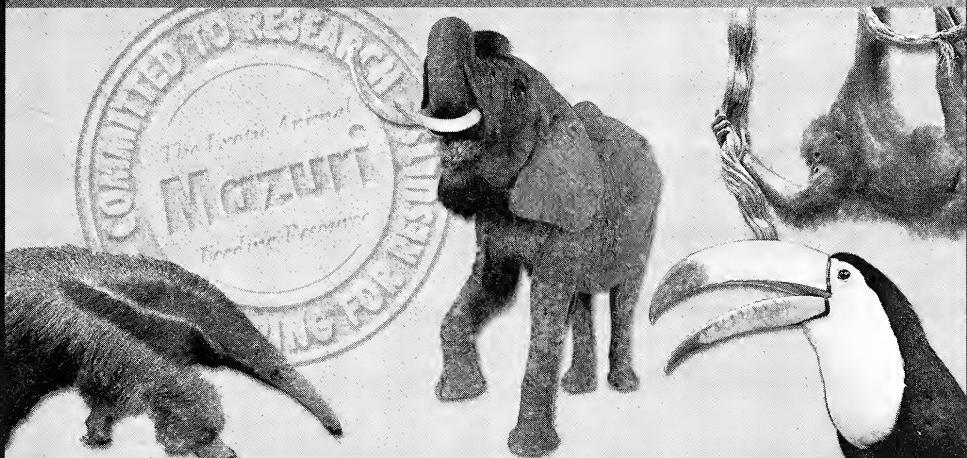
New Animal Data Transfer Form is Here! Now Find It on the Web

Do you remember the days when you were transferring an animal to a new facility and had to fill out three different ADT forms? You were probably wondering why some of the information on the forms was redundant, weren't you? Well, the redundancy is over! We all know how busy and stressful it can be when transferring animals between facilities. It can be very time consuming to fill out all of the paper work. In 2007, the Animal Training Committee of AAZK, Inc combined all three forms into one easy form to use.

The Animal Data Transfer form is a form that is used when transferring animals from one institution to another. All of us have the same goal: to provide the best possible care for the animals we care for. The information on the form provides the receiving institution staff with the right tools that they would need to give that animal the best care possible. This form includes all the information someone would need about an animal from diet to behavioral history to training and enrichment history. The form can be found at www.aazk.org, About Us link at top of page, Animal Data Transfer Form link on left side of page.

AAZK encourages staff working with the animal prior to shipping to fill out the form. Your manager doesn't have to be the one to fill it out. Most of the time, the keepers know the animal history the best. Any information you can give the receiving institution, no matter how small you may think it is, will be very helpful.

Happy Animal Transferring! If you have any questions about the form, please contact Tammy Root, AAZK National Board Member, at troot@indyzoo.com.



DIETS AS DIVERSE AS THE ANIMAL KINGDOM

Working in partnership with zoos and aquariums, MAZURI® PhD nutritionists develop industry leading products specifically for each species. From aardvarks to zebras, we work hard to give your animals the most of what they need.

For more information on MAZURI® products—including nutritional analyses and research findings—visit www.mazuri.com

or call 1-800-227-8941 for the location of your nearest dealer. Because when it comes to great nutrition, we're committed to the health and longevity of every animal.

Mazuri®
The Exotic Animal Feeding Resource

www.mazuri.com

From the Executive Director . . .

There is never a good time to raise membership dues.

Our Association has only increased membership fees three times in the past 25 years.

This is a difficult decision, but one that must be made. The economy is beginning to rebound so in order to maintain our goals, objectives and publications, beginning on January 1, 2010, individual membership dues will increase by \$5.00.

Your membership is important to this Association. Beginning in 2010, AAZK will initiate a membership recruitment campaign in all categories. We have identified a targeted strategy for membership recruitment and we will be calling upon our membership to help this program to succeed. There are some interesting gaps that we need to fill. Did you know?

There are over 200 AZA-accredited institutions, but less than 80 AAZK Chapters.

In facilities where an AAZK Chapter has been established, less than 50% of those facilities are AAZK Institutional Members. It is estimated that less than 15% of the professional animal keepers in accredited institutions are members of AAZK. Associate and Affiliate membership in AAZK has decreased by over 100 individuals in the past two years.

The combined membership dollars account for over 55% of our operating budget, with Chapter Fees covering another 30%. Increasing membership in all categories and, more importantly retaining those members over the course of their professional careers, is a goal that we must achieve beginning in 2010. With membership recruitment and retention, it is hoped that membership dues will not have to increase until the end of the next decade.



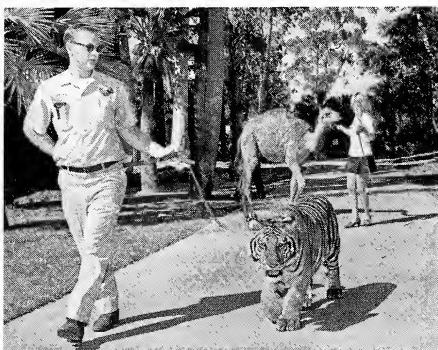
Thank you for all the hard work you do in support of
AAZK.

Ed Hansen
Executive Director

In Memorium

Gerald "Red" Thomas

November 25, 1936 ~ September 26, 2009



Red and San Diego Animal Ambassador Joan Emberry walk a couple of zoo residents.

wonderful world of animals on the "Tonight Show" starring Johnny Carson.

A former Marine, Red had a quiet competence and grace under pressure. He didn't have formal animal training but was good at doing things on the fly" noted Ron Ringer, a senior keeper at

San Diego who had worked with Thomas. "Red learned on the job and he was good at everything he did."



Red and one of San Diego Zoo's Koalas.

conceived in 1967 by these seven zoo keepers from San Diego. Their goal was to establish an organization that promoted professional growth for keepers and encourage communication between keepers from other institutions. Red was instrumental in forming this organization which, 42 years later, has grown into a full-scale professional organization with over 2400 members from almost 250 animal care organizations.

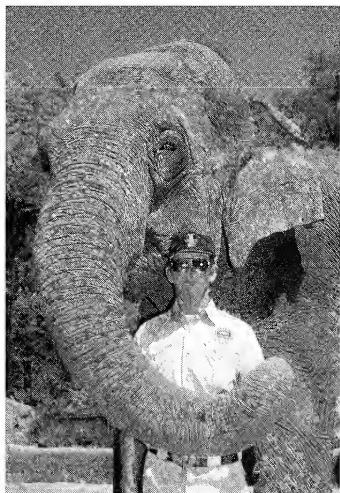
Red is survived by his wife Bernadette; son Gary; daughters Nancy, Ellen and Barbara; step-daughters Annie and Kasey; brother Montey and sister Anita; as well as 15 grandchildren and four great-grandchildren. He will be missed.

(Photos courtesy of the Zoological Society of San Diego and AAZK, Inc.)

The American Association of Zoo Keepers lost one of its founding members, Gerald "Red" Thomas on Saturday, September 26th. Red was a senior elephant keeper at the San Diego Zoo from 1962 until 1999.

"Red Thomas was a great mentor to new keepers, always willing to share his knowledge," comments Joan Emberry, San Diego Zoo's Conservation Ambassador. "He was open to learning new ideas despite his years of experience. He put his ego aside, as evidenced by the number of times he remained behind the stage curtain; on the ready to lend a hand, if necessary."

Red worked with Joan on many occasions while she educated guests about the



Red and one of his elephant charges at the San Diego Zoo.

Red Thomas, Dick Sweeney, Conrad Grayson, Dennis Melvin Ken Willingham, Carl Pyle and Walter Bromley were the seven Founding Members of the American Association of Zoo Keepers. The concept of a professional organization for animal caregivers was



Red with AKF Editor Susan Chan and AAZK Administrative Secretary Barbara Manspeaker at the 1987 AAZK Conference in Milwaukee where the AAZK Founders were honored.

AAZK, Inc. Thanks Its Chapters for Their Support in 2009

In 2006 the Board of Directors adopted a policy of recognizing the monetary contributions of AAZK Chapters to the Association. These contributions are a combination of donations, re-charter fees, and duty obligations forwarded to the Association. The AAZK Board of Directors and Staff would like to thank all of the AAZK Chapters for their support

Platinum (\$2000 and up)

The Greater Cleveland Area AAZK Chapter
Utah Chapter of AAZK

Gold (\$1000 to \$2000)

Cape May County Zoo AAZK Chapter
Columbus AAZK Chapter
Indianapolis AAZK Chapter
Milwaukee County Zoo AAZK Chapter
St. Louis AAZK Chapter
Audubon Park AAZK Chapter
Phoenix Chapter of AAZK
Southern Ontario Zoo Keepers AAZK Chapter

Silver (\$500 to \$1000)

New England Chapter of AAZK	Rosamond Gifford Zoo AAZK Chapter
Greater Philadelphia AAZK Chapter	National Capital AAZK Chapter
North Carolina AAZK Chapter	Georgia AAZK Chapter
South Florida AAZK Chapter	Palm Beach Zoo AAZK Chapter
Birmingham Zoo Chapter of AAZK	Nashville AAZK Chapter
Memphis Zoo AAZK Chapter	Louisville Zoo AAZK Chapter
Detroit Zoo AAZK Chapter	Minnesota Zoo AAZK Chapter
Lincoln Park AAZK Chapter	Greater Kansas City AAZK Chapter
Topeka Zoo AAZK Chapter	Sedgwick County Zoo AAZK Chapter
Omaha AAZK Chapter	Little Rock Zoo AAZK Chapter
Tulsa Zoo AAZK Chapter	Dallas Zoo AAZK Chapter
Greater Houston AAZK Chapter	San Antonio Zoo AAZK Chapter
Rocky Mountain AAZK Chapter	San Diego AAZK Chapter
EFBC Chapter	San Francisco Bay Area Chapter of AAZK
Puget Sound AAZK Chapter	

Bronze
(Up to \$500)

AAZK Chapter of New Bedford
Beardsley Zoo AAZK Chapter
Greater Baltimore Chapter of AAZK
Jacksonville AAZK Chapter
Lion Country Safari AAZK Chapter
Knoxville Zoo AAZK Chapter
Toledo Zoo AAZK Chapter
Battle Creek AAZK Chapter
Brookfield AAZK Chapter
Central Illinois AAZK Chapter
Riverside Zoo AAZK Chapter
Oklahoma City Zoo AAZK Chapter
Galveston Chapter of AAZK
El Paso del Norte AAZK Chapter
Snake River AAZK Chapter
Tucson AAZK Chapter
California Desert AAZK Chapter
Honolulu Zoo AAZK Chapter
Point Defiance AAZK Chapter

Roger Williams Park Zoo AAZK Chapter
The Seneca Park Zoo AAZK Chapter
Chesapeake AAZK Chapter
Greater Orlando AAZK Chapter
Tampa Bay AAZK Chapter
Jackson Zookeepers Association
Greater Cincinnati Chapter of AAZK
West Michigan Association of Zoo Keepers
The Scovill Zoo AAZK Chapter
Ozarks Chapter of the AAZK
Baton Rouge Zoo AAZK Chapter
Fort Worth Zoo AAZK Chapter
West Texas Chapter of AAZK
AAZK of Cheyenne Mountain Zoo
Wildlife World Zoo AAZK Chapter
Los Angeles Zoo AAZK Chapter
Orange County AAZK Chapter
Portland AAZK Chapter
Assiniboine Park AAZK Chapter

To the 78 Chapters that contributed to the American Association of Zoo Keepers in 2009:

Thank You for Your Support!

Big Cat Internships Available
Join us in
“Saving Tigers One by One”



As seen on Animal Planet®
“Growing Up Tiger”
Apply at: www.tigercreek.org



Learn about Big Cat Management. Internship involves Animal Care Apprentice and Public Education. We offer experience that counts towards employment.

TIGER MISSING LINK FOUNDATION / TIGER CREEK WILDLIFE REFUGE

Coming Events

**Post Your Coming Events Here
email to: akfeditor@zk.kscoxmail.com**

February 21-24, 2010 - Giraffe Professionals Conference to be held in Phoenix , AZ. The International Association of Giraffe Care Professionals is pleased to announce the first-ever conference "All of the Above" devoted to all aspects of giraffe care in captivity. All individuals interested in giraffe and the advancement of their care are invited to join us for this groundbreaking event. Conference is being hosted by the Phoenix Zoo with sponsorship from the Oakland Zoo. For more information, registration or for those who may be interested in presenting at the conference, please visit <http://www.giraffecare.org/>

March 3-6, 2010 - International Association of Avian Trainers and Educators (IAATE) Conference held in Albuquerque, NM. It's not too early to start planning to attend the 2010 IAATE Conference hosted by Avian Ambassadors in Albuquerque, New Mexico. The 2010 IAATE Conference will provide a wonderful opportunity to learn more about avian training, show content, educational messaging, enrichment ideas, avian health and welfare from the leading authorities in the industry. Get ready for Conference Trips, Workshops, Visit the Rio Grande Zoo and Aquarium, and we are bringing back the Training Panel. **Stephen J. Bodio** is our Keynote Speaker. Steve was born and educated in Boston and has lived in Magdalena , New Mexico, for over twenty years. He has traveled extensively in Europe, Africa, and especially Asia. His book **Eagle Dreams** is about the Kazakh horsemen of Mongolia . It is the journey to and in writing this book that Steve will talk about with his slide presentation. We also have **Susan G. Friedman, Ph.D** with a featured paper on Saturday morning! Dr. Friedman is a psychology professor at Utah State University with a special interest in applied behavior analysis (ABA), the technology of behavior change so effective with human learners. Over the last decade, she has pioneered the dissemination of ABA principles, procedures and ethical standards to improve the quality of life for animals. For more information visit www.IAATE.org and start planning today!

This year, Online Registration is available! Go to www.IAATE.org for all registration and conference details. Online registrations must be submitted and Mail-in registrations must be postmarked by February 6, 2010. Walk-in registrations will be accepted at the conference.

Hotel Reservations must be made by February 14, 2010 to get the special IAATE rate.

April 15 –18, 2010 - 4th Otter Keeper Workshop - the Cincinnati Zoo in Cincinnati, Ohio will host. This year the focus of the workshop will be expanded to include all of the otters managed under the Otter SSP® North American river otters, Asian small-clawed otters, African clawless, African spot-necked and giant otters. Keepers working with any of the species are welcome to attend. Topics will include: captive management

issues, enrichment, training, water quality, health care, nutrition, diet, hand-raising, exhibit design, lots of sharing of information between keepers.

Registration will be \$75 and the deadline is December 15, 2009. Spots fill up fast so please register early. A waiting list will be maintained once the workshop is filled. Due to the popularity of the workshop, priority will be given to first time attendees. Please just one registrant per institution. No refunds after January 15, 2010. Accommodations: A hotel near the Cincinnati Zoo or the Newport Aquarium. Room negotiations are ongoing. Roommates are encouraged. You will be matched if you indicate that you wish to have a roommate. Information can be found on: www.OtterSpotter.com

For more information contact: David Hamilton at Seneca Park Zoo, 2222 St. Paul St., Rochester, NY 14617; phone: 585-336-2502; 585-266-5775 fax dhamilton@monroecounty.gov

April 25-30, 2010 - Animal Behavior Management Alliance (ABMA) Annual Conference - In Pittsburgh, PA. The theme of this 10th Anniversary Conference is "Defining a Decade: Animal Management - Past, Present, and Future".

Conference programming includes: Dr. Vint Virga, a Veterinary Behaviorist as keynote speaker, formal presentations, numerous workshops and seminars, a poster session, and site visits to animal facilities. All conference details can be found at www.theabma.org. The conference will be held at the Hilton Pittsburgh located in downtown Pittsburgh. Mention that you are with the ABMA and receive a special room rate of \$119/night Reservations must be made by March 23, 2010 at 412-391-4600. Contact Nicole Begley at nicole.begley@aviary.org or 412-323-7235 ext 216 with questions.

May 11-15, 2010 - International Gorilla Workshop – 2010 - Oklahoma City Zoo is excited to host the 2010 International Gorilla Workshop. We hope you'll join us for these informative sessions. Our keynote speakers who are confirmed are Dave Morgan and Charlene Jendry. We are in final confirmation stage to get Dr. Ilana Kutinsky here as our third keynote. The Gorilla Workshop was created to promote and improve husbandry, management and conservation of gorillas. It is necessary to collaborate with colleagues to better provide for and understand gorillas in our care. The 2010 Gorilla Workshop will include a number of topics with an emphasis on multi-male and bachelor groups, as well as innovative and best practices in gorilla husbandry. The deadline for abstracts is 10 February 2010.

Abstracts must contain the following:

- Author's name, affiliation, address, e-mail address and phone number
- Title of paper
- Concise description of paper not to exceed 500 words (single space)
- On a separate page please provide a concise bio of the author/presenter

Suggested Topics (1 full day will be devoted to each main topic): Innovations and best practices in gorilla husbandry: Retro-fitting existing cages; Innovations in exhibit and holding design to facilitate husbandry; Philosophy driven husbandry programs - What's yours and why does it work for your facility?; How to promote mother-rearing; Surrogate programs;; Behavioral husbandry - What is working to promote innovations in gorilla management?; Multi-male and bachelor groups: Best practices - What's working at your facility? What's not and how can we learn from it?; Research Updates; Complexities such as holding/exhibit design; Introduction strategies; Management strategies; Field Work and Conservation: Ape Sanctuaries/Updates from the Field; Fundraisers to support in situ work; and In or Ex-situ conservation education programs.

Please send via e-mail or CD (in Word format) to:
Laura Bottaro OR Donna Mobbs, OKC Zoo, 2101
NE 50th St., Okla. City, OK 73111 Emails:
LBottaro@okczoo.com DMobbs@okczoo.com

Registration fees of \$195 are due by 10 February 2010. A late fee of \$30 will be assessed after 10 February. Ten dollars from each registration will be combined to benefit one or more in situ conservation project(s). If you have other general question about the workshop, OKC, etc, please contact Brian Aucone, BrianA@okczoo.com, 405-425-0283.

August 30 - September 3, 2010 - 7th International Penguin Conference - in Boston, MA. Hosted by The New England Aquarium. For info email ipcoston@neaq.org

September 28-October 2, 2010 - 20th International Zoo Educators' (IZE) Biennial Conference - at Disney's Animal Kingdom, Orlando, FL. For more information, please visit <http://www.izea.net>

September 7-12, 2010 - National AZAD Conference
Hosted by Brookfield Zoo, Brookfield, IL USA.

Call for Papers for AKF Dedicated Issue on Avian Husbandry and Breeding

Zoo and aquarium animal collections are experiencing a crisis in sustainability. Without successful husbandry and breeding we stand to lose the diversity that is vital to great collections. This is being strongly felt in the avian world. In March of 2010 there will be a dedicated issue to avian husbandry and breeding. We are seeking articles pertaining to what has worked, and often more importantly, what has not worked in the art and science of avian husbandry and breeding. By sharing information we can begin to make collaborations and work towards building stronger and sustainable populations.

Papers should be submitted electronically in MS Word **only** to akfeditor@zk.kscoxmail.com. Please put Avian Special Issue in your subject line. Papers should be no more than 10 pages in length. Any charts or graphs should be submitted as separate jpg or tif files along with the manuscript. We would encourage photos of your animals to include and these should also be submitted electronically as either jpg or tif files. Please make certain all photos are high resolution (300 dpi)

If you cannot submit your materials electronically, you may send them on a disk or CD to: Dedicated Issue, AAZK, Inc., 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054. If you cannot submit your photos electronically, you may also send 3x4 inch prints. Be sure to include proper photo credit and suggested captions for each photo are appreciated.

You should also include your complete contact information including address, email and daytime phone number where you may be reached if we have questions concerning your submission.

Deadline for receipt of articles for consideration is

*******January 5, 2010*******

The AAZK Behavioral Husbandry Committee Presents

Training Tales...



Where you can share your training experiences!

*Training Tales Editors – Jay Pratte, Zoo Atlanta; Kim Kezer, Zoo New England;
and Angela Binney, Disney’s Animal Kingdom*

The Behavioral Husbandry Committee wants to hear your ‘Training Tales’ – the good, the bad and the fabulous!

Please submit your “Training Tales” and experiences in operant conditioning to share with Animal Keepers’ Forum readers. This opportunity provides a convenient outlet for you to exhibit your training challenges, methods and milestones with the AAZK member network. Please submit entries based on the following guidelines:

- a) Submit a brief description of a training project at your zoo. These can be 500 words or less, in text or bullet points. Or it can be longer (up to 1000 words) if you wish to elaborate; however, short and simple descriptions with a few images are just as perfect. Details should include the following:
 1. Define the training goal (what did you try to do and for what purpose?)
 2. List important steps (How did you do it – include plans that changed along the way/what worked & what didn’t work)
 3. Timeline used (how long did it take)
 4. Tips you learned along the way
- b) Include 1-2 digital photos (jpg or tif in high resolution [300 dpi] that clearly depict the animal in the learning process or performing the desired goal. Please list source and photographer of each image and a suggested caption for each photo submitted).
- c) Please Note: We do not mind reprinting material if it is particularly useful to our readers; however, we want to be sure to give proper credit to previously published material. If your entry is not a first time publication, please include publication information (Journal name, Volume, Issue, Pages) with your submission.

Please send entries or questions to: Jay Pratte at jpratte@zooatlanta.org, Kim Kezer at kkezer@zoonewengland.com or Angela Binney at Angela.C.Binney@disney.com (use Training Tales Entry as the subject line).

Happy Training!

AAZK Announces New Members

New Professional Members

Thomas Anderson, **Squam Lakes Natural Science Center (NH)**; Caitlyn Hoskyns, **Buffalo Zoo (NY)**; Stephanie Vaugh-Williams, **Virginia Safari Park (VA)**; Laura Schillinger, **Birmingham (AL)**; Dara Kelly, **Brookfield Zoo (IL)**; Kelly Briggs, **Kansas City Zoo (MO)**; John Fitchett, **Audubon Nature Institute (LA)**; Sara Caruso, **Fort Worth Zoo (TX)**; Deeanna Croasmun, **Pilot Peak Wildlife Park (NV)**; and Michael Bates, **San Diego Zoo (CA)**. We no longer print the names of those Professional Members who do not list their facility on their membership application/renewal (There was one for October).

New Institutional Members

Wildlife Conservation Society
Bronx Zoo, Bronx, NY

Steven E. Sanderson, PhD., President/CEO

Buffalo Zoo, Buffalo, NY
Donna Fernandez, President/CEO

Renewing Institutional Members

Louisville Zoo, Louisville, KY
John Walczak, Director

Boonshaft Museum of Discovery
Dayton, OH
Mark Mazzei, Director

Northeastern Wisconsin Zoo
Green Bay, WI
Neil Anderson, Director

Renewing Contributing Members

John Rowden
Central Park Zoo
New York, New York

Janell Lentz
Coralville, IA

William H. Disher
San Diego Zoo Volunteer
San Diego, CA

Mark Your Calendars! Upcoming AAZK National Conferences

2010 - Philadelphia, PA - August 22-26

2011 - San Diego, CA - August 24-28

2012 - Syracuse, NY - September 23-27

For information on upcoming AAZK conferences, watch the AAZK website at www.aazk.org

Upcoming AZA Conferences

September 11-16, 2010 - AZA 2010 Annual Conference - Hosted by Houston Zoo, Houston, TX.

September 12-17, 2011 - AZA 2011 Annual Conference - Hosted by Zoo Atlanta, Atlanta, GA

September 8-13, 2012 - AZA 2012 Annual Conference - Hosted by Phoenix Zoo, Phoenix, AZ

September 7-12, 2013 - AZA 2013 Annual Conference - Hosted by the Kansas City Zoo, Kansas City, MO

For info on AZA Conferences, see http://aza.org/ConfWork/AC_intro/index.html

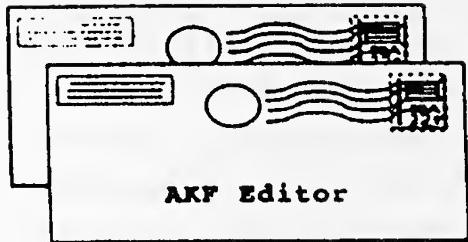
THE GOURMET RODENT, INC. TM

RATS AND MICE

Bill & Marcia Brant

12921 SW 1st Rd., Ste 107,
PBM #434
Jonesville, FL 32669

(352) 472-9189
Fax: (352) 472-9192
e-mail: GrmtRodent@aol.com



Letters to the Editor

Readers are welcome to comment upon material published in Animal Keepers' Forum through a Letter to the Editor. We welcome a free exchange of ideas benefiting the zoo keeping profession.

6 October 2009

Dear Ms. Chan,

I've just received my October 2009 issue of *Animal Keepers' Forum*, and I noted on the last page, in the Conservation/Legislative Update, a news brief about the juvenile chimpanzee at The Institute of Greatly Endangered and Rare Species (T.I.G.E.R.S.) bottle-feeding an infant puma.

I was disappointed to see AAZK giving press to this organization, when the practices at T.I.G.E.R.S. are in such direct opposition, philosophically and ethically, to professional zookeeping standards. AAZK is surely aware of the inappropriate husbandry practices used to manage apes that are presented in such unnatural circumstances, and of the fact that such undignified portrayals have a demonstrably adverse effect on their status as a highly endangered species.

The Chimpanzee SSP®, Orangutan SSP® and Ape TAG are working hard to raise the public's awareness of the endangered status of apes, and presentation of frivolous and harmful images of these animals – in a professional publication section headed "Conservation" – counters this critical message.

Performing apes, such as the juvenile presented by T.I.G.E.R.S., are taken from their mothers at a very young age. This causes tremendous emotional and psychological distress to the mother as well as to the infant. Trainers frequently use fear and physical discipline to control their apes, and the degree of force increases as the apes grow.

Such performing apes are youngsters. Audiences see cute, cuddly, human-like animals and they often form the impression that they are easily handled. These images make young apes popular as pets and for use in the entertainment industry. However, as AAZK is aware, adult chimps are much larger than babies, much stronger than humans, very strong-willed, and can seldom be handled. Zoos often receive calls for help from owners who can no longer manage these intelligent, powerful animals. A zoo or sanctuary may be able to take in a few of these abandoned chimpanzees, but most of them are placed back in the pet trade and all too often in very inhumane conditions.

Images like those promoted by T.I.G.E.R.S. serve to undermine the welfare and conservation goals that AAZK works hard to achieve. I respectfully request that AAZK review its editorial policies in order to prevent such inadvertent promotion of organizations and facilities whose business philosophy and ethical position stands in opposition to professional animal management standards.

Thank you for your consideration.

Sincerely,

Lori Perkins Chair, Orangutan SSP®
Director of Animal Programs, Zoo Atlanta
AAZK Affiliate Member

We thank Lori for her thoughtful letter but wish to remind readers that the appearance of any article in this publication does not imply endorsement by Animal Keepers' Forum or AAZK, Inc. We welcome your letters on this or other topics of interest related to AKF. ~Eds.

Dear Editor,

I wanted to express my sincere and humble thanks for the Lifetime Achievement Award that was awarded to me at the recent AAZK Conference. I was very disappointed that I was unable to attend the conference and appreciate Gisela Wiggins picking it up for me. To receive this award from an organization that has played such a prominent role in my career as a zoo keeper, and also as registrar at the North Carolina Zoological Park, means a great deal to me. I want to thank my co-workers, cohorts and friends at the N.C. Zoo for their nomination of this honor.

In looking over my zoo keeping career, I really don't think I would have had as much success without AAZK. Over the last 25 years, the role of zoo keeper has changed and expanded tremendously which has positively affected the care and lives of animals; and AAZK has played a vital role in this change. For me, being able to attend the annual conference for 13 consecutive years was invaluable because: "Invaluable" - was information and the newest techniques learned that could be brought back to the zoo; "Invaluable" - was networking among fellow keepers with similar challenges in their workplaces; "Invaluable" - was the camaraderie and friendships made; "Invaluable" - was the message of conservation and appreciation of our world; "Invaluable" - was the "spark" and "energy" generated and received that kept me going until the next conference! The many AAZK publications offered over the years, especially *AKF*, were also helpful in providing fresh ideas and up-to-date information.

I have been blessed to be able to work in a zoo setting with such awesome animals and fellow co-workers, where I was allowed at times to "try something new." What a privilege it has been to share life with them. I have been blessed to visit Lewa Downs twice and see some of the species that I worked with in their natural habitat.

I encourage all you "youngsters" to participate in AAZK in any way you can. You all have something to offer and I promise you, one day you'll realize that what you are receiving is far greater than what you are giving. Carry on!

Lucy Segerson, Retired Zoo Keeper/Registrar
North Carolina Zoological Park
Asheboro, NC

(Editor's Note: Lucy also certainly gave back to this Association, both with her local AAZK Chapter and by her service on national committees and the national Board of Directors. See page 411 of the October issue of *AKF* for Lucy's profile. Our congratulations again to Lucy for this much-deserved recognition. SDC)

GREEN TIP of the MONTH

A team of internationally renowned marine researchers led by Roberto Danovaro of the Polytechnic University of Marche, Acona, Italy, learned that UV blocking chemicals in sunscreen are causing coral bleaching. Parabens, cinnamare, benzophenone, camphor derivatives can rapidly cause viral infections that promote coral bleaching which kills off coral even if present in small amounts. Twenty five percent of sunscreen applied to the skin is released in the water during the course of only twenty minutes. The presence of these chemicals produces high levels of viral infections that kill off algae necessary for coral reefs to survive. Those swimming, snorkeling and diving near coral reefs should not wear sunscreens with the above named ingredients as they are causing the coral to die. Reefs that are exposed to humans wearing sunscreens are in jeopardy.

How can you protect your skin and the coral reefs?

Use a sunscreen with eco-compatible UV filters such as kaolin, zinc oxide, titanium dioxide. You can also use sunscreens that have physical, reflective filters and eco-friendly chemical ingredients will help our critically important coral environment survive.

Source: *Suncreens Cause Coral Bleaching by Promoting Viral Infections; Danovaro, Bongiorni, Corinaldesi, Giovannelli, Damiani, Astolfi, Greci and Pusceddu; Environmental Health Perspectives; volume 116, Number 3, March, 2008. (doi:10.1289/10966; <http://dx.doi.org/>)*

Crisis Management Resources for Zoos and Other Animal Care Facilities

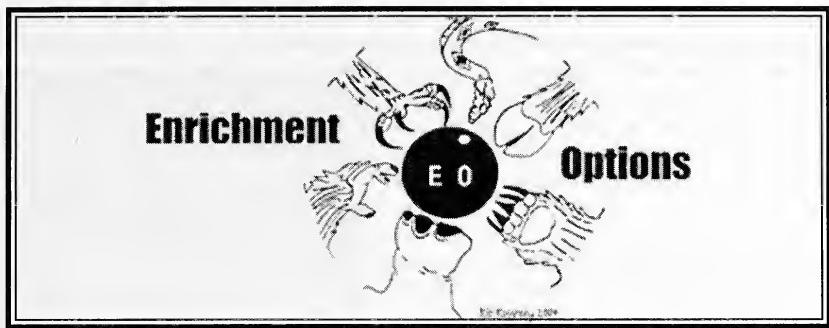
©2009 American Association of Zoo Keepers, Inc. All rights reserved. ISBN: 978-1-927672-20-2

New Resource CD Available from AAZK, Inc.

This CD includes - in searchable PDF format - all of the papers, resource lists, and species protocols originally published in the 400+ page book, Resources for Crisis Management in Zoos and Other Animal Care Facilities (1999), as well as all the manuscripts published in the November/December 2007 issue of Animal Keepers' Forum dedicated to crisis management in zoos. The original 1999 book has been out of print for some time and is no longer available for purchase.

The CD is searchable by author, title or word. Chapter Titles from the original Crisis Management Book include: Factors That Influence Crisis Management in a Zoological Setting, Developing an Emergency Preparedness Plan, Emergency Response and Crisis Management Teams, Public Relations and the Crisis Situation, Animal Restraint and Animal Identification Techniques, Dealing with a Crisis Situation: Case Studies/Zoological Crisis, Case Studies/Natural Disasters, Case Studies/Manmade Disaster, Case Studies/Injury or Death at the Zoo, and Taxon-Specific Crisis Management Protocols. The Appendices includes Resource Lists, Sample Forms and a list of Vendors with products useful in crisis situations. Included papers from the dedicated issue of *AKF* include: Crisis Management Planning in Zoological Institutions, Disease Risk Communication and Highly Pathogenic Avian Influenza, Developing a Weapons Team for Dangerous Animal Emergencies, Who's Afraid of the Big Bad Wolf?, Chemical Restraint of Exotic Animals in a Emergency Situation, The Veterinary Role of First Responders to a Medical Emergency in a Crisis Management Situation, Critical Incident Stress Management: A Proven Tool for Addressing Staff Needs After a Traumatic Event, Developing a Program for Dangerous Animal Emergencies: Procedures for Animal Escapes, Unauthorized Person in with Dangerous Animals, Dive Safety in Zoos and Aquariums, Wildlife! One Facility's Response and Lessons Learned, Keeping Communications Equipment Powered in an Emergency, The Terrorist Threat to Zoological Institutions, Hurricane Preparedness: Lessons Learned from Hurricane Katrina, Training Dangerous Animals Safely is No Accident, Firearms Use and Training in AZA Institutions, and Aspects of a Safety Program for Zoos and Aquariums.

Cost of this resource CD is \$25.00 for AAZK Members and \$50.00 for nonmembers. First class postage is included. This CD may be ordered online at the AAZK website (www.aazk.org) under "Publications" or you may order by calling the AAZK Office at 785-273-9149 and making your purchase with a Mastercard or Visa.



EO Editors -

Julie Hartell-DeNardo, Oakland Zoo and Ric Kotarsky, Tulsa Zoo & Living Museum

Making a Splash! Humboldt Penguin Enrichment at the Milwaukee County Zoo

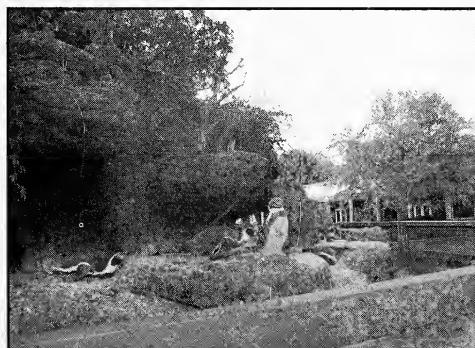
*By Heather Neldner, Zookeeper
Milwaukee County Zoological Gardens, Milwaukee, WI*

In September of 2005, we started an enrichment program for the flock of Humboldt penguins (*Spheniscus humboldti*) at the Milwaukee County Zoo with the goals of encouraging the birds to swim and to interact with each other more. Two of the birds (Houdini & Arisco) have chronic foot issues and we were hoping they would improve with more swimming.

The Milwaukee County Zoo's Humboldt Penguin exhibit is the first exhibit guests see when entering the zoo. It is an open air exhibit, with a large rocky structure and a 15,000-gallon pool. The birds have access to the exhibit and indoor holding area 24/7 all year long. We currently house 6.5 penguins with the oldest bird being 23 years old and the youngest having hatched in May of 2008. Prior to starting a formal enrichment program for the birds, they were only offered a Boomer Ball®, some plastic bottles

with colored objects sealed inside them, and ice blocks once in a while to play with. Most of their enrichment was in the form of interacting with the public through the glass viewing windows.

The first step in the enrichment program process was to complete the paperwork to obtain approval, via a three-level process, for the items we chose. The first level is obtaining supervisor approval, then it moves on to our curator for second approval, and then on to the veterinarian for final approval. Currently we have 30 items approved for our birds but not all of the items have been utilized as yet. Most of the items are dog toys because they are very durable and most of them float.



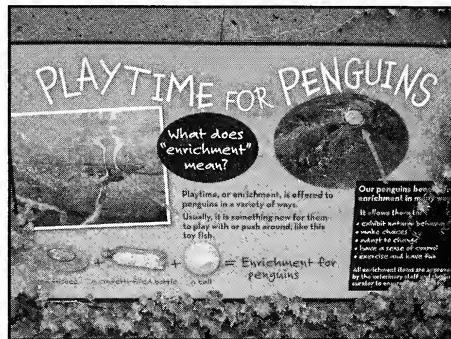
Milwaukee County Zoo Humboldt Penguin Exhibit

Toys are only given in the pool while we can supervise the birds to make sure they interact with them appropriately. This also gives us the opportunity to do enrichment talks during this time, if the public seems interested in what is going on. We are also hoping (and it has seemed effective) that if toys are not in the pool all the time, people will be less likely to toss items in the pool. If a bird is held inside away from the others for any reason (sickness, medical work-ups, weaning, etc) they can have a durable toy, such as a Boomer Ball®, plastic keys or a confetti bottle all the time to play with to prevent boredom. Our Graphics Department has made us a fantastic sign that explains enrichment to the public and explains why toys are only given when supervised.

It is very rare that we have any aggression between the birds (exhibited as displacement, or chasing)

when playing with the toys. They all appear to "share" the toys pretty well. Most of the birds have shown a high level of interest in the toys and rarely do any birds show fear or avoidance of a new item. If the birds appear to be avoiding a toy, I will play with the toy myself to demonstrate it is "ok" and will encourage them to join me. Usually this does the trick and the more curious penguins will start playing with the toy, with the others occasionally joining later.

Toys are rotated often since the penguins do seem to get bored with individual toys if they are offered too frequently and will stop interacting with those items. We have made an enrichment calendar to help coordinate this. Alternatively, the birds never seem to get tired of some toys. These include a small white Boomer Ball®, bubbles, confetti bottles and a tennis ball turtle. Their play sessions don't always last a long time, with a notable decrease in interactions with the toys after about 15 minutes or so frequently observed. If we sit outside and encourage the play, with praise and by interacting with the birds and the toy - for example, tossing the Frisbee® out for Houdini to "fetch" - this will encourage the birds to stay in the water longer and play with the items more. If there is a large crowd of people out by the exhibit cheering the birds on, they will play with the toys longer and more vigorously. They appear to enjoy the attention!



Colorful graphics explain the penguin enrichment program to zoo visitors.

(Photo: H. Neldner)



Mariano playing with a fabric Frisbee®

(Photo: H. Neldner)

Some of their favorite toys include: tennis ball turtle, tennis ball dumbbell, fabric Frisbee®, confetti bottle (Neldner, 2008), small Boomer Ball®, and floating plastic dumbbell. Houdini frequently puts the floating dumbbell on his back and/or flips it onto his back and puts it across his chest and floats with it there. He will also put the fabric Frisbee® on his head like a hat and swim around with it on his head. We have a motorized fish toy that the penguins frequently chase and they appear to enjoy ice blocks with silversides frozen in them, as they push the ice blocks around until the ice melts to get at the fish inside.

Some toys, such as the Kong® toy (we do not have a floating Kong®), rubber squiggly ball (colorful rubber dog ball) and plastic keys (these are a puppy toy), we have to restrict to giving inside because they sink and are hard to retrieve from the pool. We also give colored golf balls and bubbles inside. The penguins enthusiastically chase bubbles but we do not want to encourage the public to blow bubbles at any of our animals. Two toys in particular we have to watch very closely are coconut halves and the fabric Frisbee®, because several of the penguins have figured out how to push them into the filter system intakes and they are very hard to remove if they get in there. As a precaution, we always turn off the filter prior to giving these two particular items.

Through painting enrichment opportunities for the penguins we have found a way to combine enrichment and conservation. The gift shop manager proposed selling the paintings in the gift shop with the proceeds of the paintings going into the conservation fund. We decided that the money should go to Humboldt Penguin



Houdini with motorized fish toy. (Photo: H. Neldner)

conservation in Chile. As of July 2008 (we started selling paintings in the gift shop sometime in 2007), we have sold 48 paintings raising \$1,199.52 for conservation programs. We have also donated several paintings to AZA, AAZK, and IAATE silent auctions to help benefit conservation programs.

Training has been incorporated into the enrichment schedule and most of the birds get very excited, as seen by crowding around, standing on the tips of their toes and pushing and shoving to get closer

to the trainer when they know that we are going to do a training session. Training is not done every day with the birds, but we try to incorporate at least one or two training sessions a week. Station training using a piece of dry deck or a specific spot on exhibit has been extremely helpful in teaching our more aggressive birds how to wait their turn at meal times and has prevented a lot of squabbling and bruised fingers.



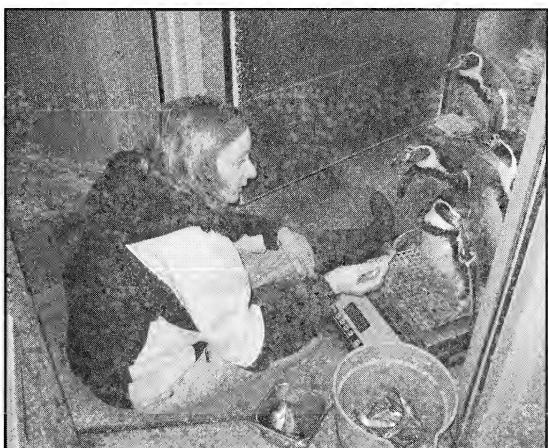
Monge painting. (Photo: Liz Schuff)

so we can look at the bottoms of his feet. We can also touch his band and change it if necessary without restraining him. He will also allow us to trim his toenails with minimal restraint. We are working with the other birds to get them used to us touching their bands too, with the goal of being able to change the bands without having to restrain the birds.

Has the enrichment been successful? We believe so. The penguins interact with each other more and spend more time swimming, with and without toys. Houdini's foot problems are always better if he swims more. One of our penguins did not historically interact with the others very much and now will interact with them when playing with toys. The penguins

We are currently training the entire flock to stand voluntarily on a scale for weighing. Most of the birds have quickly learned this and they often push and shove to be the first one on the scale. One of our youngest penguins has not figured out the stairs yet and needs to be helped down to get to the scale and our oldest bird has a hard time coming down the stairs but if she will let us help her down, she will eagerly stand on the scale.

Because of Houdini's chronic foot problems we trained him to target on our hands (sometimes he prefers to target on our boots) while he is in the water and to stay floating in front of us



The author weighs the penguins who have been scale trained. (Photo: Bryan Kwiatkowski)

seem to enjoy their one-on-one keeper time during enrichment sessions and the public genuinely seems to enjoy both the enrichment talks and watching the animals having a good time with the toys. This has also been a great way for the keepers to interact with a public by answering questions. So for a splashing good time...just add water, toys and penguins!



Houdini getting a foot check. (Photo: Amanda Ista)

References

- Neldner, Heather. (2008) "The Confetti Bottle - A Novel Enrichment" March 2008. *Animal Keepers' Forum*, Vol.35, No. 3, Pg 97-99

Professional Development Grant Final Report

*By Michael Skidmore, Keeper
Lincoln Park Zoo, Chicago, IL*

I attended the International Rhino Keepers Association Workshop in May 2009, in part due to a grant from the AAZK Grant committee. I have been to numerous AAZK National Conferences but not many relating to a specific species or group. The last conference like this I attended was the International Wolf Conference in 2000. The workshop was wonderful and very informative.

I have only worked with black rhinos but a lot of the information on whites and Asian rhinos was also helpful or may prove helpful in the future. I have already used some of the information I gathered here at Lincoln Park Zoo, such as saving browse branches for chewing in the cold months when there is no browse to help keep our rhinos teeth healthy. I have already asked our vets numerous questions on adding or taking things off our rhino's diets. We now use alfalfa cubes as a training supplement instead of running for more produce. One thing everyone learned is that there is no consensus on black rhino's diets, there were so many variations. The amount of alfalfa and grass hay fed, supplements, grain type and produce amounts all varied widely. We thought we were feeding maybe too much alfalfa at 50% but some feed almost 100% while others feed none.

Foot and skin care was also covered and I have the names of some products I would like to try here. Busch Gardens did a great job hosting, and the visits to Busch and Lowry were also well done. I would like to thank the AAZK Grant Committee as well as the IRKA scholarship committee and Lincoln Park Zoo for helping me attend this workshop.

You are encouraged to check out the granting information available in the Member's Only section of the AAZK website (www.aazk.org). If you have not as yet signed up for the Member's Only section, do so soon--it is easy and fast and offers you a wealth of resources and information not available on the public pages.

The AAZK Professional Travel Grant

The AAZK Professional Travel Grant is designed to assist AAZK members with costs associated with attending professional meetings or workshops, or, participating in field research. The applicant must be an AAZK member in good standing and demonstrate 1) the value of participating in the workshop, meeting, or research and 2) how it will contribute to their professional goals and growth. Grant winners are expected to write an article for possible publication in the AAZK Forum on their experience and submit this to the Grants Committee Chair within 3 months of completion of travel.
1 Grant available at: \$1000.00 (or split between several smaller requests)

Application Deadline: March 1 (of the year before the costs associated have been incurred)

The AAZK/AZA Advances in Animal Keeping Course Grant

The AAZK/AZA Advances in Animal Keeping Course Grant is designed to assist AAZK members with costs associated with attending the Advances in Animal Keeping Course offered through AZA.
1 Grant available at: \$1000.00

Application Deadline: March 1 (of the year before the actual class)

The AAZK Conservation, Preservation and Restoration Grant

The purpose of the AAZK CPR Committee's Zoo Keeper Grant in Conservation is to encourage and support efforts in conservation conducted by AAZK members in zoological parks and aquariums around the world.

1 Grant available at: \$1000.00 (or split between several small projects)

Application Deadline: March 1 (of the year before the actual project)

The AAZK Research Grant

The purpose of the AAZK Research Committee's Zoo Keeper Grant in Research is to encourage and support efforts in non-invasive research conducted by AAZK members in zoological parks and aquariums around the world.

2 Grants available at: \$1000.00 (or split between several small projects)

Application Deadline: March 1 (of the year before the actual project)

Assessing Immediate and Long-Term Effects of Environmental Enrichment: Implications for Welfare of African Clawless Otters (*Aonyx capensis*)

By Sanderson M.S.¹, Daigle C.L.², Stark-Posta B.^{3*}, Siegfard J. M.²

¹ Animal Care Department, Pueblo Zoo, 3455 Nuckolls Avenue, Pueblo, CO 81005

² Animal Behavior and Welfare Group, Department of Animal Science, Michigan State University, East Lansing, MI 48824

³ Toledo Zoo, Department of Behavioral Husbandry and Research, Toledo, OH 43614

*Correspondence to: Beth Stark-Posta, beth.posta@toledozoo.org or Dr. Janice Siegfard, siegford@msu.edu

Introduction

The use of environmental enrichment in zoos has become standard practice in the last decade due to its positive effects on recipients, but little is known about long-term effects on behavior and therefore welfare. Environmental enrichment can be considered any addition to an exhibit that improves both the physiological and psychological well-being of an animal by offering an external stimulus that promotes expression of healthy, internally-motivated behaviors and lessens the frequency of stereotypic or other negative behaviors (Shepherdson, 1998; Shyne, 2006; Mench, 1998).

Two African clawless otters (*Aonyx capensis*) were studied at the Toledo Zoo in 2007 to follow both the short-term and long-term effects of enrichment presentation. Wild *A. capensis* are crepuscular animals that are found in rivers, lakes and streams where they catch a variety of prey including crabs, frogs, catfish, lobster and abalone by surface swimming and bottom diving (Lariviere, 2001; Estes, 1991; Rowe-Rowe, 1986). Food is detected and gathered using the clawless, unwebbed front digits, which have heightened tactile senses, to manipulate rocks and substrate at the bottom of rivers and lakes (Estes, 1991; Somers, 2000; Somers et al., 2004).

Environmental enrichment increases mental stimulation, can alleviate social tension, and encourages natural behaviors in many captive species (Swiasgood and Shepherdson, 2005; Skibiel et al., 2007; Shepherdson et al., 1993). Enrichment in this study was designed to encourage species-specific behaviors and address the individual needs of the otters. This pair had been recommended for breeding but was coexisting in a female-dominated negative social dynamic. It was hoped that by introducing novel enrichment items that could facilitate natural behaviors, breeding would be encouraged and social tensions alleviated. Studies on other species of captive otters have determined food presentation preference (*Aonyx cinerea*; Foster-Turley, 1982), feeding habits and hunting preferences (*Lutra lutra*: Erlinge, 1968), temporal behavior patterns (*Enhydra lutris*; Antonelis et al., 1981), and strategies to alleviate undesirable captive begging behaviors (*Aonyx cinerea*; Gothard, 2007). However, no studies have been conducted on the captive population of *A. capensis*, which is currently housed in only three AZA zoos. Since little is known about wild or captive behavior of *A. capensis*, studies of similar otter species were considered when making assumptions regarding appropriate enrichment and desired behavioral outcomes, such as food preference for live prey and increased swimming and exploration with environmental complexity respectively (Foster-Turley and Markowitz, 1982; Hunter et al., 2002).

Otters are social, highly intelligent and investigative animals who respond positively to stimulating changes in their environment (Foster-Turley, 1982). Simple enrichment strategies such as providing new types of food or presenting food in new ways can increase demonstration of natural behaviors by captive otters (Gothard, 2007; Erlinge, 1968). Studies of captive otters have shown that swimming increases with increased environmental complexity (Harris, 1968). Wild otters typically utilize only the edges of water bodies during foraging (Somers and Nel, 2004). While *A. capensis* spend more

time on land and are more opportunistic than other species of otters, they rely on lakes, ponds and swamps to forage for food (Carugati and Perrin, 1998). The purpose of this study was to evaluate the behavioral changes of two captive African clawless otters over a two-month period following changes and additions to their current enrichment program. Enrichment was provided to encourage species-specific behavior, particularly those behaviors related to searching and swimming for food items in the water. It was hypothesized that increasing environmental stimulation by providing food enrichment, manipulatable items, and external scents to captive African Clawless otters would increase the diversity and duration of behaviors, enclosure utilization and positive interactions between the animals.

Methods

Two African clawless otters, 1 male (Turk) and 1 female (Jenny), were studied at the Toledo Zoo at three time points: 1) Pre-enrichment (PRE); 2) Post-enrichment 1 (immediately after regular presentation of enrichment began, POST 1); and 3) Post-enrichment 2 (after one month of regular presentation of enrichment, POST 2). Prior to implementation, enrichment items were approved



Jenny follows a trail of scent on the front island.

(Photo: Megan Sharra)

items were placed on exhibit once in the morning and again in the afternoon. One or more objects were placed on exhibit at each time to provide enough items for each otter to have an opportunity for individual interaction.

Baseline data were collected from late June to early July 2007 prior to the addition of enrichment (PRE). After regular presentation of enrichment began, additional data were collected at two time points: August 2007 (POST 1) and September/October (POST 2). Data were collected via instantaneous scan sampling twice per day between 0900 and 1700, once before noon and once after noon each day. Behaviors displayed by each otter and their location in the exhibit were noted every minute for 30 minutes. Sampling times for each data collection period were chosen to ensure that the entire 0900-1700 time-frame was evenly sampled.

Data were collected while otters were in the outdoor exhibit, which consisted of a pool that extended to the viewing glass, an island at the front of the exhibit connected by a ladder to a lower level of exhibit, and an upper level of the exhibit. The upper and lower levels encompass approximately half of the exhibit and stretch from the pool area to the back of the exhibit and lead to indoor holding. When collecting data, the observer stood at the visitor viewing window at the front of the exhibit and recorded behaviors and locations of the individuals. An ethogram of African clawless otter behavior was constructed based on preliminary observations (Table 1) and a literature review. During data analysis, these behaviors were consolidated into general categories (Table 2). Data were analyzed using simple descriptive statistics due to the small sample size ($n=2$).

Table 1: Behavioral Ethogram for African Clawless Otters at the Toledo Zoo

Behavior	Description
Walk/Run	Animal takes more than 2 steps in any direction using its feet but not in a stereotypic pattern (i.e. pacing). Does not include foraging behavior
Swim	Animal moves in any direction in the water, includes propelling oneself with limbs or tail off pool exhibit wall. Does not include searching for food
Investigation of Non-Food	Animal is exploring any part of its environment, including raising head to smell air, observe visitors, or lowering head to inspect substrate, exhibit furniture, and any other object on exhibit in land or water (including rocks, logs, enrichment devices, etc.) without actually moving or picking up item
Forage	Similar to Investigation. Animal is actively searching for food while food is present (may be walking or swimming while foraging). May consume food while continuing to forage.
Eat	Animal is either in the process of putting food in its mouth, or chewing food in a stationary position
Self-Maintenance	Animal is actively rubbing or rolling on ground (sand or grass), may include wiping sand on body or face with paws
Dig	Animal removes substrate (usually sand) with paws
Social	Affiliative interaction with conspecifics such as sniffing, grooming, play and sexual behavior
Aggression	Includes threatening behavior, charging, grabbing, and fighting with conspecifics
Inactive	Animal is stationary and not exhibiting any other behavior
Enrichment use	Animal is touching the enrichment device with any part of its body, which includes holding, rubbing on, etc.

Table 2: Consolidated non-social behaviors grouped for analysis

Category	Behaviors combined from Table 1
Locomotion	Walk/run and swimming
General maintenance	Eat and self-maintenance
Goal-directed behaviors	Forage, dig, investigation, and enrichment use (intended to note increases in species-specific activity)
Inactive	Inactive
Other	Any recording of other, out of view, and out of view active

Results & Discussion

Few studies have been published on the behavior and activity patterns of wild and captive *A. capensis* (Somers, 2000; Somers and Nel, 2004). This is an exploratory study describing behaviors of captive *A. capensis* and the effect of enrichment on behavior and exhibit use. One goal of the enrichment was to increase species-specific behaviors such as swimming, foraging and investigation levels to closely resemble natural rates, thus providing for improved animal welfare, as well as a more educational experience for visitors. PRE time budgets revealed that both otters were inactive for a considerable amount of their day. Turk in particular was inactive in over half the PRE observations. Regular enrichment increased overall activity and goal behaviors for Jenny and Turk during POST 1. In the short-term, regular enrichment increased the time both Jenny and Turk spent in the water, presumably due to the water-based enrichment. The most striking changes in POST 1 were Jenny's increase of goal behaviors from <15% to 35% and Turk's increase of locomotion from 10% to 25% of his daily budget. PRE location budgets revealed that Jenny utilized all areas of the exhibit, in contrast to Turk, who spent over 60% of his time on the lower level. While on the lower level, both otters were primarily inactive, giving visitors a poor viewing experience. Short-term goal-directed behavioral changes were observed to occur and be related to short-term exhibit location preferences (Figure 1). In the POST 1 session, Turk increased the time spent in the water to 50% and decreased the time he spent on the lower level. In the POST 2 period, Turk returned to PRE rates, spending the majority

of his time (80%) on the lower level. Jenny divided her PRE time between exhibit locations evenly, with a slight emphasis on the water and the front island (Figure 1). Jenny increased her time spent in the water in the POST 1 period, to nearly 60% of her daily budget while during POST 2 she returned to splitting her time between the lower level and in the water. Otters are crepuscular and therefore spend dawn and dusk hours foraging. Because data collection at the zoo occurred during times that wild otters would be inactive, the results could have been affected by this temporal artifact.

Social interactions between Jenny and Turk during PRE were minimal (~15%) (Figure 2). During POST 1, interactions increased to about 28%. However, during POST 2, interaction rates dropped to 10%. The existing dominance hierarchy, social tension, and limited positive contact between Jenny and Turk prior to the study warrants exploration into any effect enrichment may have on their interactions. Non-aggressive interactions increased during POST 1 session yet never directly involved enrichment items. Similar to other trends, the increased rate of social interactions was short-lived. This may have been because all observed interactions took place in the water and as time spent in the water declined to PRE levels, so did the opportunity for social interactions.

Fig. 1: Pre-Enrichment and Post-Enrichment Location Budgets

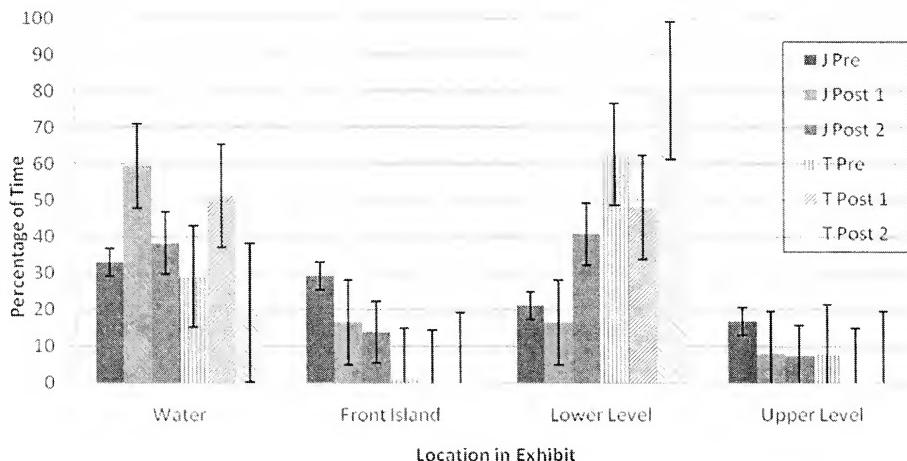


Fig. 2: Effect of Enrichment on Social Interactions

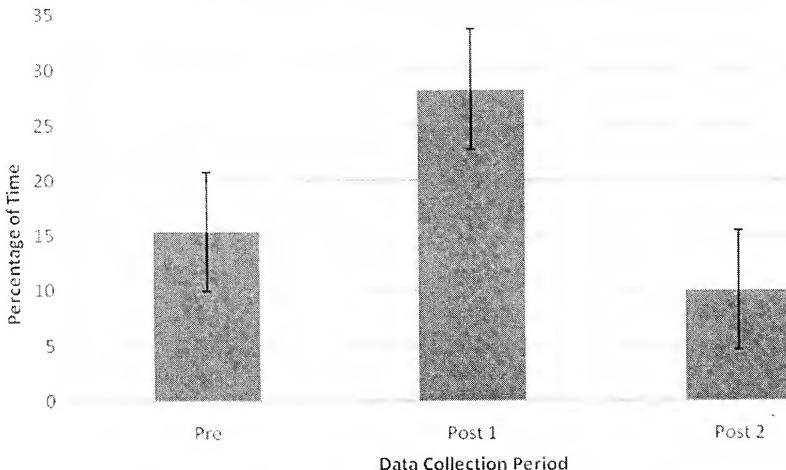
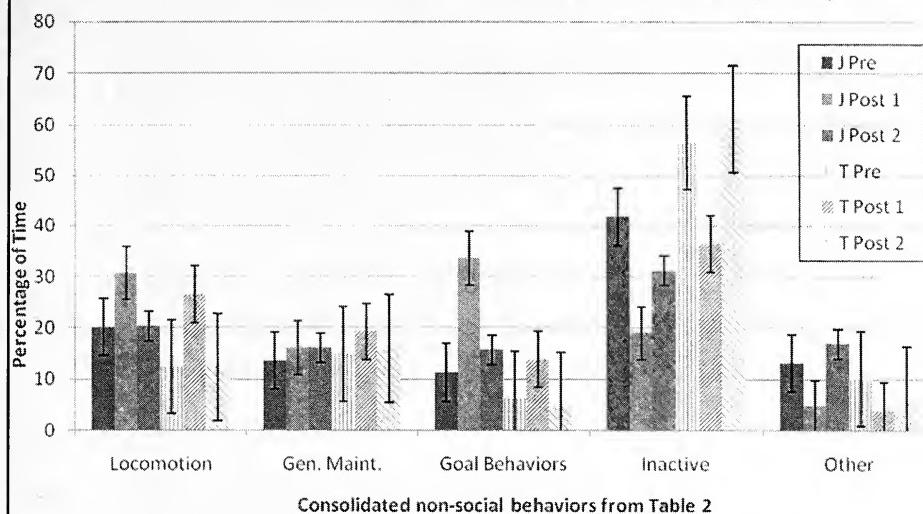


Fig. 3: Pre-Enrichment and Post-Enrichment Activity Budgets

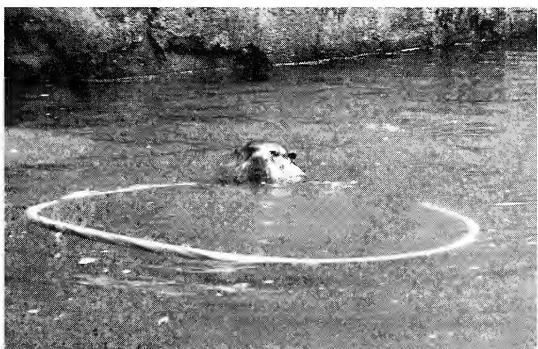


Conclusion

The return of POST 2 use of exhibit, locations, and social interactions to PRE rates demonstrates that the novelty and stimulation of enrichment can lessen over time (Shepherdson, 1998). Habituation in a captive environment is unavoidable and may need to be counteracted by a larger repertoire of enrichment items and increased variability of when items are presented. A wider array of devices would allow for longer periods between presentation of each item, possibly prolonging the effectiveness of an individual item and, in turn, improving welfare for a longer period. Furthermore, utilizing an enrichment calendar that encourages frequency and scheduling variability of enrichment presentation may help to prevent habituation and anticipation of when items will be provided. POST 2 data suggest that it is crucial to monitor the effect of enrichment beyond the initial response of the animals, as the initial response may not accurately represent long-term effectiveness.

No stereotypic behavior was observed in either otter prior to or during the study; however, adding more environmental stimulation could prevent such behaviors from occurring in the future. Increasing species-specific activity levels and diversity of behaviors displayed as well as and heightening visibility to the public were the main goals of this enrichment study. Jenny and Turk spent the majority of their time inactive during baseline data collection, but exhibited an increase in target behaviors, including increased time in the water, during initial enrichment exposure periods. The addition of regular enrichment resulted in short-term (POST 1) increases of locomotion and goal-directed behaviors and decreases in inactive behavior for both otters; however, long-term (POST 2) rates of these behaviors returned to PRE levels (Figure 3).

Our study supports the idea that appropriately designed environmental enrichment can increase positive, natural behaviors as well as exhibit use in a captive population of African clawless



Turk manipulates enrichment in the pool.
(Photo: Megan Sharra)

otters. A daily presentation of various water-based and land-based enrichment items provided enough stimulation to motivate an inactive animal to change its activity budget. However, initial behavioral changes did not last throughout the study, suggesting that increased exposure to regular enrichment items may reduce behavioral motivations and result in habituation. Therefore an initial reaction to enrichment cannot ensure its long-term effectiveness and the novelty of enrichment that initially increases overall activity can wear off within weeks. Captive enrichment programs should be evaluated regularly and careful consideration should be taken when designing, choosing, and presenting environmental enrichment to ensure the items are providing species appropriate stimulation and preventing habituation.

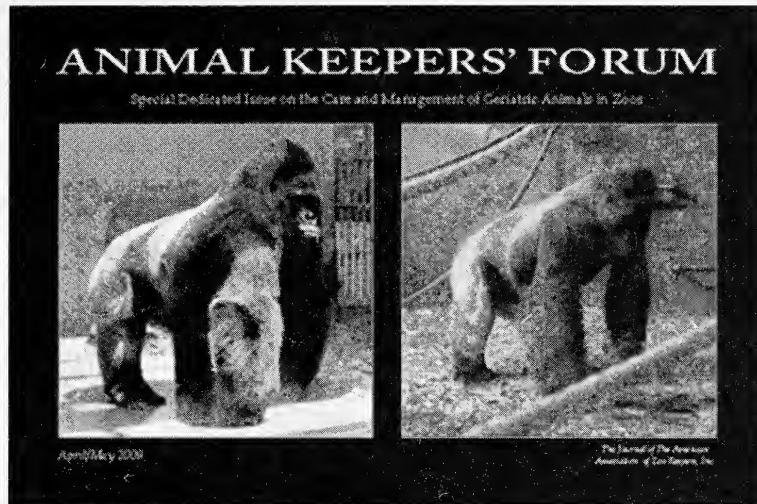
Acknowledgements

We would like to thank the staff of The Toledo Zoo for their assistance and input throughout the study and for the use of their facilities. We would also like to thank the Animal Agriculture Initiative at Michigan State University supporting presentation and publication of the results of this study.

References:

- Antonelis GA, Leatherwood S, Cornell LH, Antrim JG. 1981. Activity cycle and food selection of captive sea otters. *The Murrelet* 62 (1): 6 – 9.
- Carugati C and Perrin MR. 1998. Requirements of the cape clawless otter (*Aonyx capensis*) and the spotted-necked otter (*Lutra maculicollis*) in the Natal Drakensburg (South Africa). *Proceedings of the 7th International Otter Colloquium*, Trebon, Czech Republic.
- Estes, R. 1991. *The behavior guide to African mammals: including hoofed mammals, carnivores, primates / Richard Despard Estes; drawings by Daniel Otte ; foreword by E.O. Wilson.* Berkeley: University of California Press.
- Erlinge, S. 1968. Food studies on captive otters *Lutra lutra* L. *Okios*. 19: 259 – 270.
- Foster-Turley, P., Markowitz, H. (1982). A captive behavioral enrichment study with Asian small clawed river otters (*Aonyx cinerea*). *Zoo Biology* 1: 29–43.
- Gothard, N. (2007) What is the proximate cause of begging behavior in a group of captive Asian short clawed otters? *IUCN Otter Specialist Group Bulletin*. 24 (1): 14 – 35.
- Hunter, S., Bay, M.S., Martin, M.L., and Hatfield, J.S. (2002). Behavioral effects of environmental enrichment on harbor seals (*Phoca vitulina concolor*) and gray seals (*Halichoerus grampus*). *Zoo Biology* 21: 375-387.
- Lariviere, Serge. Mammalian Species: *Aonyx capensis*. The American Society of Mammologists. June, 5, 1002. p.1-6.
- Mench, J.A. 1998. Environmental Enrichment and the Importance of Exploratory Behavior in Shepherdson, D.J., Mellen, J.D., Hutchins, M. *Second Nature: Environmental Enrichment for Captive Animals*. Washington: Smithsonian Inst. Press. p. 30-46.
- Rowe-Rowe, D. (1986) African Otters - is their Existence Threatened? *IUCN Otter Spec. Group Bull.* 1: 9 - 11
- Shepherdson DJ, Carlstead K, Mellen JD, Seidensticker J. 1993. The influence of food presentation on the behavior of small cats in confined environments. *Zoo Biology* 12:203 - 216.
- Shepherdson, D.J. (1998) Tracing the Path of Environmental Enrichment in Zoos In: Shepherdson, D.J., Mellen, J.D., Hutchins, M. *Second Nature: Environmental Enrichment for Captive Animals*. Washington: Smithsonian Inst. Press. p. 1-12.
- Shyne, A. (2006). Meta-analytic review of the effects of enrichment on stereotypic behavior in zoo mammals. *Zoo Biology* 25: 317-337.
- Skibiel AL, Trevino HS, Naugher K. 2007. Comparison of several types of enrichment for captive felids. *Zoo Biology* 26: 371 – 381.
- Somers, M.J. (2000). Foraging behaviour of Cape clawless otters (*Aonyx capensis*) in a marine habitat. *J. Zool. Lond.* 252: 473-480.
- Somers, M. J. and J. A. J. Nel. 2004. Movement patterns and home range of Cape clawless otters (*Aonyx capensis*), affected by high food density patches. *J. Zool., Lond.* 262: 91 – 98.
- Swiasgood RR and Shepherdson DJ. 2005. Scientific approaches to enrichment and stereotypies in zoo animals: what's been done and where should we go next? *Zoo Biology* 24:499 – 518.

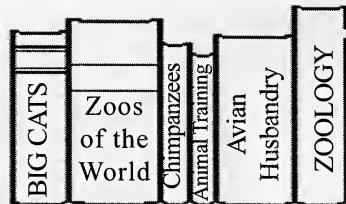
Special Double Issue of Animal Keepers' Forum Dedicated to the Care and Management of Geriatric Animals Available for Purchase



- From the President - Remembering the Golden Girls
- Acknowledgements from the Editor
- The Future is Now: New Strategies for Geriatric Care at the Oakland Zoo
- Some Thoughts on Veterinary Considerations on the Management of the Geriatric Zoo Patient
- Pachyderm Milestones
- The Oldest of the Old
- An Easy Way Out: PVC Ladder Assists Geriatric Animals
- The Old Hippo That Could
- It's a Geriatric Jungle Out There
- Joint Disease and Its Management in Captive Bear Species
- Never Too Late (Training a geriatric white rhino)
- Assiniboine Park Zoo's Debby the Polar Bear
- The Widower - Care of a Geriatric Bird at The National Aviary
- The Care and Management of Geriatric Gorillas in Captivity and The Role of Louisville Zoo's Husbandry Program
- Gravity and Hydrotherapy Procedures as a Way to Reduce the Possibility of Stiffening Joints in Elephants After an Injury
- A Public Relations Professional's Look at Geriatric Animals and Euthanasia
- Donna the Hippo is 57 years Old
- Using Cue Conditioning to Facilitate Voluntary Separation for Supplemental Feeding in a Geriatric 0.1 Scimitar-horned Oryx (*Oryx dammah*)
- World's Oldest Asian Elephant Lived to be 86 Years Old
- Some Considerations in the Care of an Elderly Red-Ruffed Lemur
- Collaborative Management and Interpretation of Arthritis in a Geriatric Giraffe
- Indoors Natural Substrates for Elephants and Medical Issues Associated with Hard Surfaces
- Old Bears, New Care
- Improving the Quality of Life for Tiffany, a 40-year-old Female Western Lowland Gorilla (*Gorilla g. gorilla*) at the Topeka Zoo
- Topeka Zoo's Long-lived Hippo Duo
- Ode to the Oldies: Geriatric Keepers Caring for Geriatric Critters
- Longevity in the Animal Kingdom
- 104 pages of great information!

Price: \$25 for AAZK Members
\$50 for Non-Members

Order at www.aazk.org (under Publications)
Or call 785-273-9149 to order by credit card



Bats in Captivity

Volume 1: Biological and Medical Aspects

Edited by Susan M. Barnard

Logos Press, Washington, DC 2009

ISBN# 978-1-934899-02-1

Price \$99.95

Also available in paperback

*Review by Steven M. Wing, Curator
Louisville Zoo, Louisville, KY*

Bats are popular zoo exhibits and this status has been growing in recent years. An informed public expects enhanced zoo exhibits and they are demanding to know that we as zoo professionals are taking the best possible care of our animals. We recognize the need for good husbandry techniques as we care for endangered species and intensify our efforts as the threat of white-nose syndrome strengthens.

There is definitely a need for all current knowledge to be in one place.

'Bats in Captivity' is an attempt to combine all that is known about keeping chiropterans in captivity into one place. The series is actually a compilation of solicited papers with 22 authors contributing to the first volume. Each chapter has been peer reviewed, formatted and arranged by the editor. Of particular interest is the inclusion of papers by bat managers from around the world.

Volume 1 encompasses the biological and medical aspects of keeping bats in captivity including, but not limited to, anatomy, physiology and the medical management of bats.

Much of this information can be found in other texts, but there is a distinct advantage to being able to find it in one place. Barnard's knowledge from many years of rehabilitating native bats is evident in the chapters dealing with common health disorders and will be especially helpful when encountering these ailments in our collections.

Extremely useful information is also included on bat restraint, anesthesia and surgery. An interesting and thoughtful chapter is devoted to euthanasia. The chapter on drug dosages and formulary will prove especially helpful to lesser experienced bat caregivers or those without regular access to seasoned zoo veterinarians, but seasoned professionals will also value this resource.

Many of us have books on our shelves dealing with the natural history of bats. But there are few works dealing to this degree with the captive medical management of bats. I would recommend this book for keepers, curators and veterinarians with bats in their collections.

Handbook of Venoms and Toxins in Reptiles

By Stephen P. Mackessy July 2009

CRC Press/Talor & Francis Group, 6000 BrokenSound Prkwy., Ste. 300, Boca Raton, FL 33487

ISBN# 978-0-8493-9165-1

xvi + 521 pages Price: \$129.00

The Handbook of Venoms and Toxins in Reptiles offers "one-stop shopping" to all biologists, biochemists, toxicologists, physicians, clinicians and epidemiologists, and informed laypersons interested in the biology of venomous reptiles, the biochemistry and molecular biology of venoms, and the effects and treatment of human envenomation. This book examines the topic generally, provides

an overview of the current taxonomy of these reptiles, explains the similarities and differences in the venom delivery apparatus in different groups of reptiles, reviews state-of-the-art knowledge about specific venom components and their action, and summarizes effects of envenomation and treatment in humans on different continents. Written by experts from 12 countries, the book has both a broad perspective and international relevance. Unlike previous books addressing venoms, this volume bridges several very different areas in modern biology and provides a synthesis of current knowledge about venoms and venomous reptiles. The wealth of illustrations, including an 8 page full color insert, present a view of reptile toxinology from the whole animal to the glands producing venoms to the molecular models and the mechanisms of actions of the toxins themselves.

To order, contact: CRC Press at 1-800-272-7737 or orders@taylorandfrancis.com

Hey, Mister ---Your Alligator's Loose!

By Gary K. Clarke, Director Emeritus - World Famous Topeka Zoo

2009 Brnaski Publishing, 214 N. 2100 Rd., Lecompton, KS 66050

ISBN#0-941974-23-3

10 1/2" x 7 3/4" 544 pgs.

\$29.95 + \$5 s/h

Review by Susan Chan, AKF Editor

AAZK Administrative Office, Topeka, KS

Gary Clarke has always been a great storyteller and his new book, *Hey Mister, Your Alligator's Loose!* combines the three things that he seems to love most - animals, people and zoos. Having known Gary for many years, I have been privy to his many zoo tales and off-the-wall sense of humor. Reading this book was, for me, like a trip down memory lane since my family and I had been heavily involved as volunteers at the World Famous Topeka Zoo during Gary's tenure as director.

Clarke began his zoo career as a seasonal keeper at the Kansas City Zoo where his love for and interest in all things animal blossomed. His career later led him to a lab research position at Midwest Research Institute (where the infamous "Big Red" snake bite occurred). A stint as a full-time keeper at Kansas City was followed by a curatorial position at the Fort Worth Zoo. In 1963, at the tender age of 24, Clarke was offered the position of Zoo Director in Topeka and inherited a rag-tag group of cast-off domestic animals, a few monkeys, a deer and a dusty bison. Crazy, right? But this was a man on a mission; a man with a vision of what the zoo could become.

This lively and delightfully illustrated volume traces Gary's years at the Topeka Zoo--how he generated amazing community support for the facility beginning with Project Noah's Ark that brought some of the first truly exotic animals to the city. The Topeka Zoo became the "little engine that could", and under Clarke's direction accomplished some pretty amazing things--for example, the first geodesic domed tropical rainforest exhibit in North America, a glass-tunneled walkway through the center of the gorilla yard of the Discovering Apes complex [DA], a month-long Koala Loan from the San Diego Zoo (at the time Topeka was the smallest zoo ever to be allowed such a loan), a Lion's Pride exhibit where lively cubs delighted visitors of all ages. The list goes on and on.

This book is a fun read filled with anecdotes about the zoo, the zoo world in general, and the amazing array of animals that have shared Gary's life (both at the zoo and at his home). You'll enjoy the stories of Djkarta Jim, the awesome male orangutan who - before the gathered dignitaries and press on opening day, calmly broke the limb of one of the steel and concrete reinforced tree limbs in DA; the tale of black jaguars Darth and Leia; the coming of lowland gorillas Max and Tiffany to the Topeka Zoo; the birth of the first giraffe in Kansas; or the amusing tale of Schroeder the Alligator who inspired the title for this book.

My only real criticism of the book is that it weighs four and a half pounds so will not be one you take to read on your next airplane trip. But it is far from a "coffee table book" and should provide the reader with a most enjoyable tour of the crazy and wonderful world of zoos. Enjoy!

ZOOTUBE on Display in 10 U. S. Zoos

Animal Planet and AZA Join Forces in Educational Kiosks

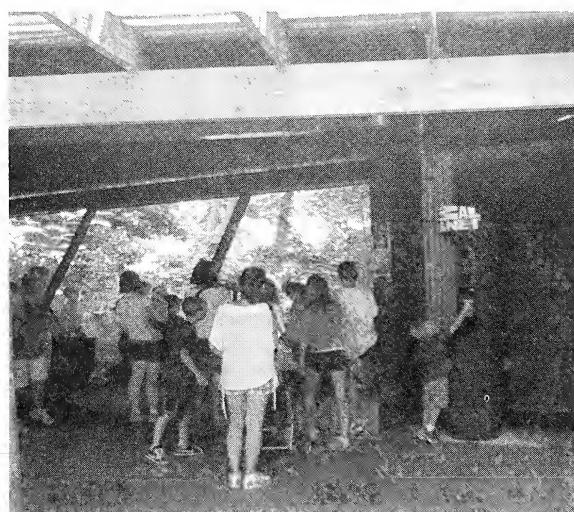


Kiosk located at Zoo Atlanta offers children an opportunity to learn more about animals and the planet.

In the September 2009 issue of *AKF* we featured an article about the interactive educational kiosks being set up in 10 zoos around the country (page 381). The project is a joint venture between Animal Planet and the Association of Zoos and Aquariums. Five more locations are planned before year's end.



A visitor checks out the ZOOTUBE kiosk at Omaha's Henry Doorly Zoo.



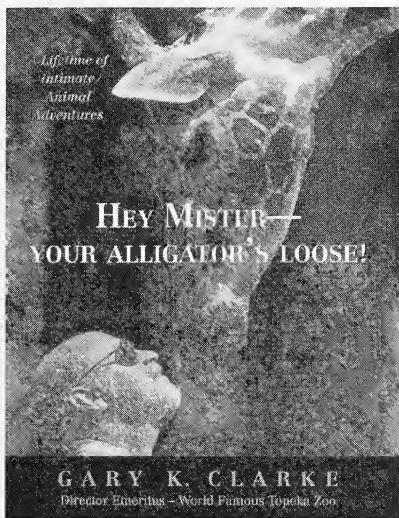
This kiosk is located near the gorilla exhibit at Zoo Atlanta.

ZOOTUBE kiosks are currently located at Busch Gardens Tampa Bay, Columbus Zoo & Aquarium, Houston Zoo, Lincoln Park Zoo, Omaha's Henry Doorly Zoo, Oregon Zoo, Philadelphia Zoo, Pittsburgh Zoo & PPG Aquarium, Saint Louis Zoo and Zoo Atlanta.

For a sneak-peak at ZOOTUBE content, visit www.aza.org/animal-planet

Photos courtesy of

Imperid
MULTIMEDIA



First Edition, Hard Bound,
Dust Jacket, 544 pages,
10 1/2 x 7 3/4 inches.
Over 70 Color and B&W
Photographs, Original Artwork.
Baranski Publishing
Company, 2009.

\$29.95 + \$5.00 shipping &
handling.

HEY MISTER--YOUR ALLIGATOR'S LOOSE!
details Gary Clarke's lifelong passion for animals and
chronicles his extraordinary career in the world of zoos.

Gary's philosophy is that zoos are unique because they are *real*.
The animals are not cartoon characters or advertising gimmicks--
they are themselves, alive in all their glory.

Everyone has a zoo story--a memorable personal experience that
has touched their life. Yet, most people really don't know how
to visit a zoo! In this book, Gary shares the allure and magic of
wondrous and incredible animals. This is an engaging read for
anyone enchanted with the animal kingdom.

Order from: Gary K. Clarke
Zoo Poo Press/AKF
P. O. Box 4863
Topeka, KS 66604-0863

Kindly make checks payable to **Zoo Poo Press**

Please indicate how you would like Gary to inscribe
your book. Telephone inquiries at 785-272-7604.

Behavior-based Bear Husbandry for Winter Denning: A practical application at Fortress of the Bear, Sitka, Alaska

Paper presented at the Advancing Bear Care Conference
November 2009, San Francisco, CA

By Christine Fenwick, Bear Manager
Fortress of the Bear
PO Box 2337, Sitka, AK 99835
oso.ursa@yahoo.com

Abstract

Behaviors were closely monitored for two, two-year old, male brown bear (*Ursus arctos*) cubs at Fortress of the Bear in Sitka, Alaska during the fall, winter, and spring of 2008 and 2009. Denning behaviors became evident in early November with changes in food consumption, and activity periods. Food consumption decreased from 14,000 kilocalories per day per bear in September to 4,100 kilocalories per day per bear in November. Killisnoo and Chaik weighed 200 and 225 kilograms respectively in September. Daylight hours and daily temperatures decreased in November; however the fall was atypically warm by two to seven degrees Celsius. Diet consumption reached a low of 1,696 kilocalories per day per bear in late December. Each bear exhibited its own unique behavioral response to the changes in the captive environment. Keeper routines changed in response to changes in bear behavior. Visitor attendance decreased, and other disturbances were also reduced. In the deepest part of winter, the bears were still eating, defecating, and urinating. The cubs had decreased activity for parts of the day, and were spending 18 to 20 hours in the den. Food consumption and activity levels returned to normal with the increase in daylight hours and temperatures of March and April. Most influential on their behavior, was the dynamic relationship between the two cubs. Although allowed to feed to satiation during the hyperphagia stage of late summer, they may not have had enough fat on them for winter denning. As cubs, their bodies continued to grow through the winter as they lost fat and gained length and height, emerging from the den 1.5cm taller than when they entered. There were also uncontrollable outside disturbances, and there may have been other factors affecting their denning behavior. The bears were fed according to their consumptive needs, given denning space and denning material.

Behavior-based husbandry utilizes the natural history of an animal to determine the appropriate husbandry practices to best meet their needs. For brown bears and black bears, there are seasonal changes that affect their behaviors, most notably during the winter, which is naturally a time of denning. In wild bears that have a sufficient fat layer to allow winter denning, there are three main behavioral cues of winter denning: 1. Decreased food and water consumption, often times ceasing to eat and drink completely; 2. Decreased activity, often spending more time near the den site as winter approaches; and 3. Entering a den and remaining in the den for prolonged periods of time, some bears will enter a winter den and remain there for up to six months in the far north (Brown, 2009). Winter denning is a complex biological and biochemical process influenced by many variables that include, but are not limited to: acquisition of a sufficient fat layer to survive a winter without food, decreased daylight hours, decreased average daily temperatures, and an appropriate denning site and denning materials. When all of the factors are present, they produce predictable winter denning behaviors. These factors are variable and are necessary to meet the changing environment from year to year as winters will differ. In captive communities, keepers are tasked with making decisions for the animals in their care to best meet the needs of those animals and the management needs of the facility. Often times keepers are required to maintain protocols that do not allow the animals to choose what is best for themselves. For winter denning in bears, many factors must align for denning to occur, and no one knows better than the bears themselves if all those factors are in line (Poulsen, 2008). The onset of winter is a time of reduced food abundance, and food reduction for denning should follow the bears' cues.

Fortress of the Bear is home to two male, brother, brown bear cubs, Killisnoo and Chaik, who turned two in the winter of 2008-2009. The exhibit has full exposure to the elements, and the bears are

exposed to year-round weather patterns, vegetation changes, and temperature changes. The den is completely enclosed providing a private, quiet, dark, and dry space. The den is not temperature controlled, and its temperature is roughly the same as the ambient temperature. The bears were observed closely throughout the year to identify behavior patterns, and husbandry protocols were modified based on the behavioral cues from the bears.



Inside the bear den. Nesting materials include straw, sticks, and shredded paper. Chaik worked meticulously to get the nest just right for winter denning. (*Photo: Christine Fenwick*)

The bears' behaviors were closely monitored on a daily basis, with observations logged in the daily paperwork. Keepers watched for: aggressive behavior, play behaviors, general activity levels, food consumption, and weight fluctuations. In the fall and winter, behaviors were monitored for denning specific cues that would indicate a change in husbandry. Denning behavior cues included: decreased activity levels, decreased play behavior, increased nest building behavior, increased time within the den, and decreased food consumption. Decreases in behaviors were determined based on a comparison to summer behaviors

exhibited by the bears. Husbandry changed as bear behavior changed. Average temperatures, daylight hours, and precipitation were recorded for each month. Kilocalorie content of the diet was figured using averages for kilocalorie content of foods normally fed. All food is donated, so the types of produce, dog food brand, and meat sources were highly variable. Average kilocalorie content for food was broken down into produce, dog food, and meat. With kilocalorie content of all types of produce averaged, all types of possible dog food brands averaged, and all types of meat sources averaged. Daily nutritional logs were kept to track the diet levels. Diets consisted of dog food, produce, and meat fed in a 1:1:2 ratio respectively. Diets were decreased in the fall based on cues from the bears, and kilocalorie content of diet changes was logged. No supplements were given, and enrichment food was counted as part of the overall diet and calculated into their overall kilocalorie intake.

August and September were months of hyperphagia for the bears, and they consumed 14,022 kilocalories per day. August and September had 16 and 12.5 hours of daylight respectively, and temperatures were 10°C [50°F]. Due to security concerns the bears were locked within a secure night holding area every night. They were released into the exhibit at 0730 in the morning, and brought back in for the night at 1930. The night holding area was set up with extensive enrichment every night to allow them the option to play and interact if they chose to. They were most active in the morning upon release into the area. They spent an average of two hours moving around the area, interacting with enrichment and with each other. They often slept at some point in the middle of the day between 1100 and 1400, and they spent upward of six hours a day playing in the pond, both with each other, or entertaining themselves on their own. Many factors influenced their behavior on a daily basis and included: weather, temperature, visitor interaction, and interactions among themselves. They were generally active again in the late afternoon, through to the evening. At night, they interacted with the enrichment, fed, and slept. Keepers arrived in the morning at 0700 for training sessions, enrichment preparation, and release of bears out into the exhibit. This was a typical routine for the bears and keepers through spring summer and fall.

In October diet consumption decreased to 10,700 kilocalories per day per bear, as they were leaving an average of a quarter of their diet uneaten. Daylight hours decreased to 10.5 hours a day, and this

affected keeper schedules. October is also the雨iest month of the year averaging 37 cm of rain for the month. The bears were let out into the exhibit at 0800 and brought back in at night at 1800. The activity pattern of the bears remained the same during the day. They were consuming all of their enrichment food in the area in the morning, but were less interested in food provided by keepers throughout the day. When brought into the night holding, the bears would eat the dog food, most of the meat, and most of the produce, leaving some produce uneaten. The bears were usually still sleeping when keepers came in the next morning to let them back into the exhibit.

In November, the greatest reduction in food consumption occurred from 10,752 to 4,100 kilocalories per day per bear. This fell further mid-month to 3,400 kilocalories per day per bear. Keepers reduced feedings based on uneaten diets. Temperatures for this month were slightly warmer than previous years at 4°C [39.2°F]. Daylight hours decreased to eight hours each day. The activity patterns of the bears changed dramatically this month, and they were given unlimited access to the den at all times so they could choose where they wanted to spend their time. The bears exhibited increased lethargy, decreased play behavior, and decreased interactions between the two bears. The common behaviors in the exhibit were laying around, walking for short periods of time followed by laying down, yawning, resting their heads on logs, increased time within the den, and increased nesting behavior. Reduction in daylight hours and temperature influenced the bears' behavior with an increased desire to nest build, spend more time sleeping within the den, and to consume less food. The bears appeared to have sufficient fat layers, bellies hanging below their knees at the start of fall, and their reduced consumption indicated that they may have had sufficient fat to den. Chaik (shy-eek) also showed an increase in nest building behavior, which prompted keepers to prepare the denning area. The bears were given straw, sticks, and shredded paper within the den. Chaik was meticulous with the den each day, breaking trees in the exhibit to bring them inside the den for the nest, and keepers responded by providing more sticks and twigs as nesting material.

Chaik spent 20-45 minutes nest building, and would build, add to, or modify the nest at least two or three times a day at the beginning of the month. Killisnoo did not participate in nest building behavior this month. He would watch Chaik rake and drag the branches in, but was never observed collecting or raking branches into the den himself.



Chaik Bear showing increased lethargy in December 2008 by resting his head on a log after a short walk in the exhibit. (Photo: Christine Fenwick)

In December, food consumption fell from 3,400 to 1,696 kilocalories and then slightly increased in January to 2,876 kilocalories, and they continued to eat through this time. Each day averaged six hours of daylight, and 0°C [32°F] through these two months. They spent an average of 20 hours within the den, most of that time was spent sleeping, but they would always get up for food fed in the exhibit, and when they could hear people. There was less snow fall than the previous two years, and temperatures were warmer than the previous two years. As growing two-year-olds, there may have been more pressure on their system to keep eating through the winter, although at greatly reduced levels. The dynamic relationship between the cubs also greatly affected their denning behavior. Chaik spent more time nest building, and was also more lethargic than Killisnoo, who only started to nest build more than a month after Chaik. Killisnoo would also lay in the den with Chaik, but would not let Chaik sleep. Killisnoo would slap or bite his brother in the den.

As the months progressed, Killisnoo calmed down, responding to his brother's decreased activity. Chaik was more active, responding to his brother's activity patterns. Diets were increased when there

was an increase of aggressive behavior from Chaik toward Killisnoo, which was usually uncommon. Increased consumptive needs may have been due to sporadic periods of clear sunny weather, which resulted in increased activity periods in the exhibit during the day. When more food was provided, the aggressive behaviors subsided. Aggressive behaviors observed included hard biting and growling with head shaking while biting whenever Killisnoo got close to Chaik in the exhibit. Chaik would engage Killisnoo in a full body wrestling match with biting and growling whenever Killisnoo approached, and an overall short temper from Chaik, which was different from his usual passive tolerant behavior toward his brother. Once more food was offered these behaviors subsided. As the nest was already made in November, they spent less time nest building, but more time in the den using the nest. Chaik would periodically take branches from the exhibit to add to the den, and keepers added nesting materials as necessary to ensure the nest remained dry, as the bears were out in the snow and their warm snow covered bodies would make the nesting materials damp. The bears came out of the den when they heard keepers working in other parts of the facility, and would re-enter the den when keepers left for the day. The bears came out of the night holding after 1000hrs most days, and would go back in around 0230hrs in the afternoon. Enrichment was removed from the daily schedule, and training was put on hold to resume in the spring.

Table 1: A comparison of daylight hours, precipitation, daily temperatures, and kilocalorie consumption. Amount of precipitation did not seem to affect or correlate with behavior changes overall.

Month	Hours of Daylight	Precipitation in cm	Daily Temp in °C	Kcal consumption First of month	Kcal consumption Last of month
September	13	28	10	14,022	12,589
October	12	37	7	10,752	10,752
November	8	28	4	4,106	3,702
December	7	24	0	3,419	1,696
January	6.5	22	0	2,876	2,876
February	9	18	1	3,771	4,257
March	11	17	2	4,823	8,021
April	14	15	4	8,520	14,890
May	16	14	8	14,890	14,890

In February, food consumption increased late in the month to 4,257 kilocalories. Daylight hours increased to nine hours a day, and the bears became more active. They came out of the den earlier in the day, stayed out longer, played more together, played on their own, and more time moving around the area, and less time within the den. There were reports of wild bears emerging from their dens in the surrounding area and on adjacent islands as early as mid-February, which is not common for



Killisnoo Bear showing increasing lethargy by resting on a log in the exhibit in January 2009.

(Photo by Christine Fenwick)

this area. Wild bears typically start to emerge from their dens in April (Schoen, Gende, 2007). The end of February was cold at 1°C [33.8°F], but a week and a half of sunny weather correlated to behavior change in the bears. Increased activity and aggression from Chaik was a definite indicator that hunger was increasing, and diets were increased. Chaik would growl and aggressively attack Killisnoo if he even came close to food. As food was increased, this behavior again subsided. Training was offered if the bears were up to participating in sessions.

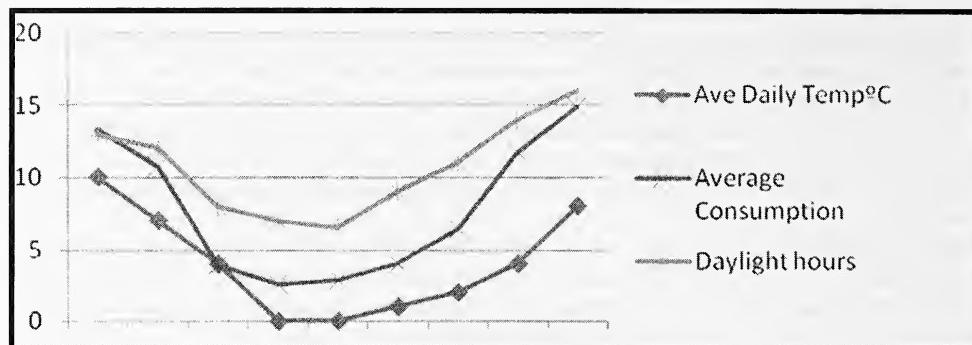


Chart 1: A comparison of daylight hours, food consumption at 1/100 scale, and daily temperature in degrees Celsius for September through May.

Consumption almost doubled in late March from 4,823 to 8,021 kilocalories. Daylight hours increased to 11 hours a day, temperatures increased to 2°C [35.6°F], and the activity level also increased. They spent only a few hours a night within the den, and transitioned to sleeping out in the exhibit space. They had completely abandoned their den by late March, choosing to sleep out in the exhibit at night as well. Their activity levels were increasing. They were more playful and active in the area so more food was necessary since they were burning more calories each day. They also showed more aggressive behaviors around food, which dissipated as food was increased. Training and enrichment was fully integrated into their daily schedule.

There was another jump in consumption in late April from 8,021 to 14,890 kilocalories, which was above kilocalorie intake of hyperphagia of last summer with a high at that time of 14,022 kilocalories. There was a growth spurt in both of the bears, increasing in height by more than 1cm. In May, kilocalorie consumption leveled off and they exhibited their normal behavior patterns consistent with last year in spring and early summer. There were 16 hours of daylight each day, and increasing daylight each day. Temperatures were unusually warm at 8°C [46.4°F], with mild weather. Enrichment schedules continued at full scale, and training and keeper interaction also remained at high levels as winter denning behaviors had completely ended, and the bears were back to their normal spring and summer behavior patterns.

There are many factors that trigger hibernation in wild bears, and the situation becomes more complicated in a captive environment. As keepers, it is necessary to understand the natural behaviors that are displayed by the bears, and make decisions to enhance and allow the behaviors to develop. The bears know best what needs to happen to meet their needs, especially when it comes to winter denning. Winter denning in brown bears and black bears is a natural process, and is triggered in part by decreases in day light and temperatures. These changes take place even in warm climates, and they can affect the behaviors of the bears in these climates as well. It is very important to know the bears well, and be able to identify the behaviors that are indicative of winter denning. Once the behaviors are identified, the behavioral cues offered by the bears should be used to guide the husbandry practices. It is difficult to meet the management needs of a facility and the animals needs as well, and a successful balance must be struck to meet all of those needs.

References

- Brown, G. The Bear Almanac, A Comprehensive Guide to Bears of the World. 2nd Edition. Guilford, CT. Lyons Press. 2009. Pg.152 - 160.
- Poulsen, E. Denning Processes. Listserve communication, March 2008.
- Schoen, J. and Gende, S. The Coastal Forests and Mountains Ecoregion of Southeast Alaska and the Tongass National Forest. A Conservation Assessment and Resource Synthesis. Anchorage AK. Audubon Society and Nature Conservancy. Chapter 6.2 Mammals: Brown Bear. 2007 Pg 7-9.

Conservation/Legislative Update

Column Coordinators: Becky Richendollar, North Carolina Zoo
and Greg McKinney, Philadelphia PA

This month's column was put together by
column co-coordinator Greg McKinney



Reintroduced Ferrets Face Poison Threat - While Canadian wildlife officials were celebrating a "historic" reintroduction of the extirpated black-footed ferret (*Mustela nigripes*) to a southern Saskatchewan park on October 2 2009, U.S. environmentalists were launching a lawsuit targeting 10 states — including Montana, which forms the Canadian park's southern boundary — where commercial prairie-dog poisons such as "Kaput" are blamed for also killing the pest's chief predator: the critically endangered ferret.

Bizarrely, the U.S. Fish and Wildlife Service — which collaborated with Parks Canada, the World Wildlife Fund and the Calgary and Toronto zoos in raising the 34 ferrets released in Saskatchewan — is at odds with its fellow federal body, the U.S. Environmental Protection Agency, over American farmers' use of the poisons to rid their fields of prairie dogs. The burrowing rodent is the primary food source of the black-footed ferret, a member of the weasel family that was presumed extinct in North America from the 1950s to 1981, when a small group of the animals was discovered in Wyoming. Catastrophic habitat loss and the near-eradication of its prairie-dog prey by Midwest farmers were blamed for the demise of the ferret by the 1950s.

Saskatchewan's Grasslands National Park is the heart of the historic Canadian habitat for the species, which once ranged in Canada from about Moose Jaw, Sask., to Medicine Hat and Lethbridge in southern Alberta. Known to have feasted for millennia on the black-tailed prairie dog (*Cynomys ludovicianus*) of North America's Midwestern plains, the ferret — a slinky carnivore with dark legs and raccoon-like, masked eyes — was last seen in Canada in 1937, near the Frenchman River in southern Saskatchewan.



Black-footed Ferret

(Photo: U.S. Fish and Wildlife Service)

The early October's reintroduction was hailed as a conservation milestone for Canada. But according to court documents filed just days earlier in the U.S. by Defenders of Wildlife and Audubon of Kansas, the USFWS fears that North America's vulnerable black-footed ferrets face an inadvertent threat of poisoning. The groups point to letters from the wildlife service to the EPA, warning that the EPA-approved Kaput and Rozol — meant to control nuisance populations of black-tailed prairie dogs — could kill endangered ferrets that eat the poisoned flesh of their prey. That, the groups argue in the suit, could derail the multimillion-dollar, North America-wide effort — in the U.S., Mexico and now Canada — to bring the black-footed ferret

back from the brink of extinction. The EPA has announced it will review the complaints about its approval of the poisons.

"I found it ironic," Defenders of Wildlife attorney Jason Rylander told Canwest News Service, "that the reintroduction effort was received with so much enthusiasm in Canada, while at the same time, our Environmental Protection Agency is approving widespread poisoning of prairie dogs — and undermining our ferret reintroduction program at the same time."

Even more startling is the proximity of the Canadian reintroduction effort to one of the states involved in the lawsuit, said Rylander. "It would be unfortunate if, in your efforts to restore ferrets, that any migrating over the border would risk being impacted by the overuse of rodenticides," he said. "It's poison."

In a joint statement by World Wildlife Fund officials from Canada and the U.S., the organization applauded the Saskatchewan ferret reintroduction as a model for "cross-border co-operation" in North American conservation. "Nature doesn't recognize the borders between the U.S., Canada and Mexico," the statement said, "so our conservation efforts must stretch across those boundaries if we are to successfully restore North America's threatened grassland ecosystems." *Source: Canwest News Service, Randy Boswell, 5 October 2009*

Hatching a Marine Breakthrough: First Triggerfish Raised in Captivity could Transform Aquarium Business - The tiny black and silver fish in a 50-gallon vat at Roger Williams University do not look like the aquaculture breakthrough they just may turn out to be. But the four-month-old tropical queen triggerfish (*Balistes vetula*), which can grow to a foot and a half long with iridescent yellows and blues, are the first triggerfish to be raised in captivity. And if researchers perfect their technique, other marine aquarium fish - including threatened ones like the queen trigger - could be raised in hatcheries instead of taken out of the wild.

"We grew them on the first real try," Andy Rhyne, assistant professor of biology at Roger Williams and a research scientist at New England Aquarium, said as he gazed at the three wriggling fish with a smile. "It's a springboard."



Queen Triggerfish

(Photo: Clark Anderson/Aqua Images)

Roger Williams and aquarium researchers teamed up to overcome a decades-old obstacle to growing many kinds of marine fish: feeding them when they are young. Today, the vast majority of freshwater fish in home aquariums are produced by aquaculture. Freshwater fish tend to be relatively easy to grow because their larvae are large, some can be fed dry food, or scientists have been working on them so long that they know how best to make them grow. But most marine fish larvae are smaller and require a live meal. Researchers have met with limited success feeding larvae tiny aquatic animals called rotifers. Those organisms can grow fast and at great densities, but are often too big to be fed to marine fish or do not have the nutritional punch they need.

As a result, only a tiny percentage of marine aquarium fish are grown by aquaculture. Most are caught in the wild. But there are problems: Some species are overfished, while others are caught in damaging and often deadly ways, such as by squirting cyanide into reefs to anesthetize the fish so collectors can gather them. In the ocean, marine fish larvae eat copepods - tiny crustaceans found virtually everywhere. But raising copepods in the lab is extraordinarily difficult. The tiny animals have complicated temperature, salinity, and food requirements.

"People have cultivated copepods over the years in moderate quantities, but no one has been able to do it in bulk," said Nancy Marcus, a copepod specialist and dean of the graduate school at Florida State University.

Rhyne, along with colleague Erik Stenn, who has an algae biotech company, were having some success with copepods in Florida. Rhyne was hired in August in a novel arrangement between the aquarium and Roger Williams to study larval fish production at the aquarium and start a program in aquarium science and aquaculture at the university.

Triggerfish seemed a natural species to attempt to grow - and one that New England Aquarium scientists had tried for years to rear. Queen triggers grow too large to be a popular home aquarium fish, but their size and coloration have made them popular in public aquariums. Since they are threatened, Rhyne and Michael Thulst, the aquarium's director of research, figured if they could grow a queen trigger, aquariums would not have to take them from the wild. This summer, researchers collected tens of thousands of queen triggerfish eggs from one nest in the aquarium's giant ocean tank and brought them to the marine lab at Roger Williams, overlooking Narragansett Bay. Thousands

hatched, but the team focused on a relatively small number to feed with a local species of copepod they were growing. Most died, but today four remain alive - three at Roger Williams and one at the aquarium - and all have grown large enough to be fed dry food.

There is a long way to go, Rhyne said: Copepods are still incredibly fussy to raise. But he said he is getting closer to figuring out how to raise large quantities of them. And the fact they grew a triggerfish with the copepods gives the scientists hope that other species could be grown in the same way for public aquariums. Their work may also one day affect the estimated \$250 million trade in ornamental marine fish - some species of triggerfish are worth \$500 each. Even if businesses raise only small amounts of copepods, it could be profitable because the fish are so expensive.

"There is a lot of economic pressure to [raise] marine fish," said David Lass of Nahant, an aquarium fish specialist. But the ability to raise marine hobby fish comes with great responsibility, Thlusty said. Many are caught in an environmentally responsible way and serve as a key economic engine to impoverished areas of the world. In some cases, the fish collecting provides revenue - and incentives - to keep swaths of reefs conserved. "It really needs to be put in a global perspective," Thlusty said. "You can't start producing every marine species in captivity." Still, he said, raising the marine fish is exciting.

"When I came here 10 years ago, there was a proposal floating around to raise triggerfish. It's exciting [we did it] but it points out the enormous amount of work that still needs to be done." *Source: Boston Globe, Beth Daley, 28 September 2009*

Palau Creates World's First Shark Sanctuary - The tiny Pacific nation of Palau is creating the world's first shark sanctuary, a biological hotspot to protect great hammerheads (*Sphyrna mokarran*), leopard sharks (*Triakis semifasciata*), oceanic whitetip sharks (*Carcharhinus longimanus*) and more than 130 other species fighting extinction in the Pacific Ocean. But with only one boat to patrol 240,000 square miles (621,600 square kilometers) of Palau's newly protected waters — including its exclusive economic zone, or EEZ, that extends 200 miles (320 kilometers) from its coastline — enforcement of the new measure could be almost like swimming against the tide.

Palau's president, who announced the news to the United Nations General Assembly, acknowledges the difficulty of patrolling ocean waters nearly the size of Texas or France with a single boat. But he hopes others will respect Palauan territorial waters — and that the shark haven inspires more such conservation efforts globally.

"Palau will declare its territorial waters and extended economic zone to be the first officially recognized sanctuary for sharks," Palauan President Johnson Toribiong told the Associated Press in an interview.

Shark fishing has grown rapidly since the mid-1980s, driven by a rising demand — mainly in China — for shark fin soup, a highly prized symbol of wealth. Because of their long life spans and low fertility rates, sharks are vulnerable to overfishing. Within its EEZ, a nation may regulate fisheries and scientific research and develop other economic efforts. The U.N.'s Food and Agriculture Organization estimates more than half of highly migratory sharks are overexploited or depleted. Toribiong said a recent flyover by Australian aircraft showed more than 70 vessels fishing Palau's waters, many of them illegally.

"We'll do the very best we can, given our resources," he said. "The purpose of this is to call attention to the world to the killing of sharks for commercial purposes, including to get the fins to make shark fin soups, and then they throw the bodies in the water."



This undated photo provided by the Micronesian Shark Foundation shows sharks from an allegedly illegal Taiwanese fishing vessel busted in Palau on Aug. 5, 2009.

Tourists go to Palau for its spectacular diving in the tropical waters, dramatic coral and rich marine life. The remote Pacific nation recently made global headlines when it agreed to President Barack Obama's request to take a group of Uighurs — Turkic Muslims from China's far western Xinjiang region — as part of plans to close the Guantanamo Bay detention center. Palau is one of the world's smallest countries, with some 20,000 people scattered over 190-square mile (490-square kilometer) archipelago of lush tropical landscapes in the Western Pacific. Its shark sanctuary will shelter more than 135 Western Pacific species of sharks and rays considered endangered or vulnerable, or for which there is not enough data to determine how the species is faring.

"Palau has basically raised the bar for the rest of the world for shark conservation," said Matt Rand, director for global shark conservation for Washington-based Pew Environment Group, an advocacy organization.

Elsewhere, Europe is trying to crack down on shark fishing in its waters. In February, the European Commission proposed its first-ever shark conservation rules for European waters. EU countries account for a third of shark meat exports globally, and shark steaks are increasingly served in restaurants, replacing pricier swordfish steaks, and shark products are also finding their way into lotions and leather sports shoes.

Toribiong said he also will call for a global moratorium on "shark finning" — the practice of hacking off shark fins and throwing the body back into the sea — and an end to unregulated and destructive bottom trawling on the high seas. Palau is among 20 seafaring nations that already have voluntarily agreed to end bottom trawling, which involves fishing boats that drag giant nets along the sea floor. Enormously effective at catching fish, the nets from bottom trawling also wipe out almost everything in their path, smash coral and stir clouds of sediment that smother sea life, marine experts say. The U.N. has called bottom trawling a danger to unique and unexplored ecological systems and said slightly more than half the underwater mountain and coral ecosystems in the world can be found beyond the protection of national boundaries. *Source: The Associated Press, John Heilprin, 24 September, 2009*

Alaska Sea Otters Granted Critical Habitat Protection - It took a court order to accomplish, but threatened sea otters in southwest Alaska now will have some respite from the pressure of human activities. The U.S. Fish and Wildlife Service has designated 5,855 square miles of nearshore waters along the Aleutian Islands, Bering Sea, and Alaska Peninsula as critical habitat for the northern sea otter (*Enhydra lutris kenyoni*). The Service does not anticipate that this critical habitat designation will result in any closure of commercial fishing in southwest Alaska because sea otters eat bottom-dwelling creatures of no commercial value and spend most of their time in shallow water close to the shore. The agency took this action under a court order resulting from a lawsuit against the Service by the Center for Biological Diversity.

"Critical habitat has a proven record of aiding the recovery of endangered species," said Rebecca Noblin, a staff attorney with the Center in Anchorage. "We are pleased that habitat for threatened Alaska sea otters will finally be protected. With the habitat protections of the Endangered Species Act now extended to sea otters in Alaska, this iconic species has a fighting chance of recovery."

The Center first petitioned the Service to protect sea otters in southwest Alaska under the Endangered Species Act in August 2000. Two lawsuits and five years later, sea otters in this region received protections provided by the law, following population declines of up to 90% in many areas. Fewer than 40,000 otters were estimated to exist in southwestern Alaska in 2005, down from more than 100,000 in the 1970s. Declines are most pronounced in the Aleutian Islands, where the population has dropped from more than 70,000 to fewer than 10,000 animals. The exact cause of the decline is unknown, but scientists have speculated that increased predation by killer whales (*Orcinus orca*) may be a factor. Sea otters in the area are also threatened by proposals to open Bristol Bay in the Bering Sea to oil development, along with changes to the ecosystem brought about by global warming and overfishing.

The Endangered Species Act requires that critical habitat be designated when a species is listed. Congress has emphasized the importance of critical habitat, stating that "the ultimate effectiveness of the Endangered Species Act will depend on the designation of critical habitat."

But the Bush-era Fish and Wildlife Service took the attitude that critical habitat designations were a hindrance that did not benefit listed species. In all critical habitat press releases during the Bush administration, the Fish and Wildlife Service wrote, "In 30 years of implementing the Endangered Species Act, the Service has found that the designation of critical habitat provides little additional protection to most listed species, while preventing the Service from using scarce conservation resources for activities with greater conservation benefits. In almost all cases, recovery of listed species will come through voluntary cooperative partnerships, not regulatory measures such as critical habitat."

Under the Obama administration, the Service has not been using that language. Recognizing that the Bush administration would designate critical habitat only as a result of litigation, in December 2006 the Center filed a lawsuit in federal district court in Washington, DC, seeking critical habitat for Alaska's sea otters. In April 2007 the Center reached an agreement with the Fish and Wildlife Service, which provided that critical habitat for the otter had to be finalized by October 2009. The recent habitat designation includes all nearshore waters in the current range of the southwest Alaska population of the sea otter within 100 meters of mean high tide, waters less than two meters in depth, and kelp forests in waters less than 20 meters deep. In total, the areas making up the otter's critical habitat equate to 5,855 square miles. While the designation includes critical areas for the sea otter, it falls short, the Center says, because it fails to protect deeper waters and areas further from shore that the otter also needs to recover.



Alaskan Sea Otter

(Photo: U.S. Fish and Wildlife Service)

The Interior Department has proposed opening up areas in the Bering Sea near Bristol Bay to offshore oil and gas development, but such development would be devastating for sea otters, Noblin warns. Because they rely on their fur as insulation against the cold, sea otters are extremely vulnerable to oil spills. As many as 1,000 sea otters died from the Exxon Valdez oil spill in 1989. More recently, the Selendang Ayu oil spill in the Aleutian Islands in December 2004 killed numerous animals in this vulnerable sea otter population.

"While today's habitat designation is an important step in preventing the extinction of sea otters in southwest Alaska," said Noblin, "we still must do much more to ensure their eventual recovery, including protecting offshore habitat and eliminating the threat of oil development in Bristol Bay."

The worldwide sea otter population was reduced to just a few hundred animals between 1742 and 1911, due to commercial harvest by the Russian and Russian-American fur trade. Three populations of sea otters exist in Alaska today, but only the southwest Alaska population is listed as threatened. The Service estimates the statewide population at around 70,000 animals. *Source: Environmental News Service, 8 October 2009*

Argentine Zoo to Release 3 Endangered Eagles - An Argentine zoo plans to release three endangered crowned eagles (*Stephanoaetus coronatus*) back into the wild after several months of rehabilitation during captivity. The birds are to be taken to Catamarca, San Juan and La Pampa provinces for reintroduction into nature. Biologists will monitor them through tracking devices placed on their backs. Trainer Andres Capdeville says the raptors are the most threatened species of eagle in South America — fewer than 1,000 exist in the wild, according to a 2004 estimate. Capdeville said that while at the Buenos Aires Zoo, the birds' rehabilitation program included frequent flights to rebuild muscle after captivity. One underwent surgery for a bullet wound in the foot. *Source: The Associated Press, 30 September 2009*

White House to Rethink Endangered Species Lists - From wolverines to black-tailed prairie dogs, dozens of plants and animals around the nation are being re-evaluated for possible inclusion on threatened or endangered species lists. The Obama administration is taking a fresh look, in many cases under court order, at Bush administration rejections of special status for certain plants and animals. A move to prevent extinction of more species could limit housing construction and energy development.

New species under consideration for protection have “aesthetic, ecological, education, historical, recreational and scientific value,” and those facing extinction “could be indicators of bigger ecosystem problems that could hurt us,” said Bridget Fahey, regional director of endangered species for the Interior Department’s Fish and Wildlife Service.

“Science shows that when you start removing species from our ecosystem things can start to break down,” Fahey said.

In Colorado, the state government is working through a parallel process to protect imperiled animals. State wildlife overseers, who took the initiative of re-introducing the lynx (*Lynx canadensis*), recently began weighing the feasibility of a state wolverine-recovery program.

The wolverine (*Gulo gulo*) “has a reputation of being sort of a bad-tempered animal that tends to break into cabins and wreak havoc. It’s not the same charismatic type of critter the lynx is. But we have the type of habitat that could sustain wolverines,” said Tom Nesler, chief of wildlife conservation for Colorado.

At the federal level, Endangered Species Act litigation has forced a re-evaluation of dozens of species rejected under President George W. Bush, including the mountain plover (*Charadrius montanus*), wolverine, greater sage grouse (*Centrocercus urophasianus*), white-tailed prairie dog (*Cynomys leucurus*) and the Gunnison sage grouse (*Centrocercus minimus*).

The proposal to add 19,000 acres to the current 20,000 acres designated as critical habitat for the Preble’s meadow jumping mouse (*Zapus hudsonius preblei*) also is tied to court action. A nine-inch-long brown rodent with enlarged rear feet, the mouse forages in wetlands along Colorado’s high-growth Front Range from Fort Collins to Colorado Springs. It’s one of eight species nationwide for which federal courts have ordered reconsideration following a finding of inappropriate political meddling by a Bush administration deputy assistant secretary for fish, wildlife and parks.

In response to petitions for dozens of other species, federal wildlife officials have begun in-depth analyses of survival threats, including climate change, that could qualify each as endangered. While environmentalists say they’re hoping President Barack Obama and Interior Secretary Ken Salazar will move to protect many more species, some expressed doubts.

The Obama administration’s environmental interests focus “more on energy and land issues” than on saving endangered species, said Kieran Suckling, executive director of the Center for Biological Diversity. Tom Strickland, assistant secretary of the Interior for fish, wildlife and parks, said the administration is trying to balance the two interests.

“We have a very strong commitment in this administration to promote renewable energy. But that will not be done at the expense of other environmental considerations,” Strickland said. “We will do our best to harmonize those twin goals.” *Source: The Denver Post, Bruce Finley, 7 October 2009*

Nine Wolves Taken So Far in Montana - Hunters in Montana reported taking nine wolves through the beginning of October 2009 in the state’s first-ever organized wolf hunt. Gray wolves (*Canis lupus*) were removed from the endangered species list in Montana and Idaho in the spring after climbing back from near-extinction last century. Before their endangered listing, the animals were poisoned, shot and trapped, but never subject to a regulated hunting season. This year’s hunt has a quota of 75 of the predators. Montana wildlife officials say the hunts are needed to control increasingly frequent wolf attacks on livestock. But environmentalists who filed a lawsuit over the issue say the species remains at risk. More than 10,500 wolf licenses have been sold in Montana this year, only 50 of them to nonresidents. *Source: The Associated Press, 6 October 2009*



Gray Wolf

(Photo: U.S. Fish and Wildlife Service)

AAZK Membership Application (Please Print)

Check here if renewal []

Name _____

Email _____

Mailing Address _____

City _____ State/Province _____ Zip/Postal Code _____ Country _____

U.S. Members

\$40.00 Professional

Full-time Keeper

\$35.00 Affiliate

Other staff & volunteers

\$25.00 Student

*Must supply copy of current student
ID at time of application*

\$65.00 or up - Individuals
Contributing/U.S.

\$150.00 or up
Institutional/U.S.
*Organizations/Institutions
(requires Board approval)*

\$150.00 Commercial Member
(i.e. animal-related food & supplies)

\$55.00 International Members *(All members outside U.S. & Canada regardless of category)*

Canadian Members

\$40.00 Professional

Full-time Keeper

\$40.00 Affiliate

Other staff & volunteers

\$25.00 Student

*Must supply copy of current student
ID at time of application*

\$65.00 or up - Individuals
Contributing/Canada

\$150.00 or up
Institutional/Canada
*Organizations/Institutions
(requires Board approval)*

\$40.00 Library Only
*Available ONLY to public &
university libraries (In U.S.)*

Zoo Affiliation (if any) _____

Zoo Address _____

Title _____

My check is enclosed (AAZK, Inc.) Please charge my credit card

Mastercard Visa Card# _____ - _____ - _____ - _____

Name on card _____ Expiration date _____

Signature _____

Mail this application to: AAZK Administrative Offices, 3601 SW 29th St., Suite 133, Topeka, KS 66614-2054. Make checks/money orders payable to AAZK, Inc. **Must be in U.S. FUNDS ONLY**. Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free or discounted admission to many zoos and aquariums in the U.S. and Canada.



The logo features a detailed illustration of a rhinoceros's head and upper body in profile, facing left. The text "AMERICAN ASSOCIATION OF ZOO KEEPERS" is written in a bold, serif font, with "AMERICAN" on the first line and "ASSOCIATION OF ZOO KEEPERS" stacked on the second line. The word "ZOO" is enclosed in a small circle.

Bettlern Service Beauftragter

*“Dedicated to
Professional Animal Care”*

*"Dedicated to
Professional Animal Care"*

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 01519 9953

Non-Profit Organization
U.S. POSTAGE PAID
Topeka, KS
Permit # 646

*****MIXED AADC 65340
9/10 GRP 1
National Zoo Library TRAY 4
Visitors Center - WRC 551
PO BOX 37012
WASHINGTON DC 20013-7012



Animal Keepers' Forum
35th Anniversary
1974 - 2009